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NEW AND LITTLE-KNOWN BEES.

BY T. D. A. COCKERELL.

The bees described and recorded in this paper are mostly in the British and Berlin Museums. In the British Museum last year I was allowed to mark among the enormous accumulations of unworked material the specimens which I desired to study, and these were later sent to me. In this way I was enabled to examine an unusually interesting series of specimens from different parts of the world. At the same time I obtained the loan of the splendid Turner collection of Australian bees, also in the British Museum, and so am able to make considerable additions to the known Australian fauna. I am greatly indebted to Mr. Geoffrey Meade-Waldo and Mr. Rowland E. Turner for their assistance and co-operation in all these matters.

In the descriptions of venation the following abbreviations are used: s. m. = submarginal cell; r. n. = recurrent nervure; t. c. = transverso-cubital nervure; b. n. = basal nervure; t. m. = transverso-medial nervure.

Paracolletes vigilans (Smith).

A specimen labelled "Nov. Holl. occ. Pr." (Berlin Museum, 2555) was found to exactly agree with Smith's account of *Leioproctus vigilans*, and also with my notes made from Smith's type, but apparently to differ in having a large bidentate process on the postscutellum. I asked Mr. R. E. Turner to look at Smith's material in the British Museum, and having done so, he reports the presence of the postscutellar process just as in the Berlin Museum example. It is strange that it was overlooked both by Smith and myself.

Paracolletes dentiger sp. nov.

♀. Length about 12 mm., rather slender, superficially looking just like *Andrena mimetica* Ckll. Deep purplish-blue, strongly punctured, the pubescence black and white; hair of head mostly white, but black on vertex, upper part of front, clypeus except lower corners, and scape; mandibles with an inner tooth; clypeus mostly greenish, with dense

very large punctures, and an imperfect smooth median band; sides of front dull and rugose; face on each side of clypeus covered with appressed white hair; flagellum obscurely brownish; fourth and fifth antennal joints very short, broader than long; mesothorax and scutellum densely punctured; postscutellum with a stout median spine or tooth, which emits a few long curled black hairs; pleura with large irregularly placed punctures; area of metathorax triangular, dullish, its upper part transversely striate; hair of thorax mostly white, black on scutellum and disc of mesothorax, also black just beneath wings; tubercles densely fringed with white hair, making them appear as white spots; tegulae shining piceous; wings dusky, especially dark in upper part of marginal cell and on apical margin; b. n. meeting t. m., the latter oblique; first s. m. very long; second small, receiving first r. n. at its basal corner; second r. n. received about beginning of last third of third s. m.; legs reddish-black, obscurely submetallic, the hind ones distinctly metallic, their hair white, that on the inner side of hind basitarsus fuscous; abdomen with a fine sculpture, running into delicate transverse striae, which have a wavy appearance; segments covered with a very fine white tomentum, shining in favorable lights; apex with black hair; venter with white hair; fifth ventral segment green.

By the armed postscutellum this is allied to *P. vigilans*, but it differs in color, venation, sculpture and the character of the postscutellar process.

Hab.—Australia; "Nov. Holl. occ. Pr." (Berlin Museum, 1952). Collected by Preiss.

Paracolletes plumosus (Smith).

Victoria (C. F., Turner collection). On the right side the first r. n. enters middle of second s. m., but on the left it enters at the end of the first third. This variation increases the probability that *P. plumosellus* Ckll. is the male of *plumosus*, but nevertheless I believe it is distinct, as I have before me another male which must surely be veritable *plumosus*. This insect is like *plumosellus*, but larger (expanse $18\frac{1}{2}$ mm.), with the head and thorax a yellower green (essentially as in *plumosus*), the vertex and much of scutellum and hind part of mesothorax with dark fuscous hair, the anterior tibiae bright red in front, and the other tibiae and tarsi partly red. The tongue is colletiform. This male *plumosus* is from Melbourne, Victoria (Rolle; Berlin Museum).

Paracolletes bicolor (Smith), var. a.

A male from W. Australia (*Dr. J. Burton Cleland*; British Museum) is referred here as a variety, although the legs are not at all red, except slightly at apex of hind tibiæ, and on anterior tibia in front. The vertex and mesothorax also are strongly green. This agrees in size with *plumosellus*, but is easily separated by the abundant black hair on vertex, scutellum and hind part of mesothorax. The abdomen is narrower and duller than in *plumosus*, and dark purplish. The flagellum is quite strongly crenulate beneath. The three species, *plumosus*, *plumosellus* and *bicolor*, are closely related, but evidently distinct.

Paracolletes flavomaculatus Ckll.

This species was described from a male. A female from the Turner collection comes from Cairns, Queensland, "Kur., 9. 02." It is slightly over 10 mm. long, and agrees with the male except for the usual sexual differences. It agrees with Smith's description of *P. cristatus*, except that the hair of the face is reddish-black, not griseous, the wings are uniformly dilute fuscous, and the large scopa of the hind tibiæ is entirely dark fuscous. The hind spur of hind tibia has five long sharp teeth. Tongue colletiform as usual.

It is probable that this will prove to be a subspecies or variety of *P. cristatus*.

These bees curiously resemble the black species of *Prosopis* with yellow scutellum and postscutellum common in Australia. The yellow dorsal patch in the *Prosopis* is tegumentary, in the *Paracolletes* due to hair, but the superficial effect is the same. To my astonishment I find also an *Halictus* with the same coloration (the patch due to hair), so similar to *Paracolletes flavomaculatus* that I had no doubt of its being a close relative until I came to examine it in detail.

Halictus paracolletinus sp. nov.

♀. Length about 8 mm., black, the scutellum, postscutellum and tubercles covered with felt-like ochreous hair. This looks exactly like a small edition of *P. flavomaculatus*, but differs as follows: eyes more converging below; clypeus with sparser, much weaker punctures;

front very minutely rugosopunctate (with distinct strong punctures on a shining ground in *flavomaculatus*); flagellum ferruginous beneath at base; hair of front and vertex pale yellowish; mesothorax dullish, finely punctured all over, very densely at sides; mesopleura dull and densely rugosopunctate (shining, with sparse strong punctures in *flavomaculatus*); area of metathorax with fine longitudinal rugæ; lower section of basal nervure very strongly arched; first r. n. meeting second t. c.; hind tibiæ with a moderate, largely pale scopa (nothing like the broad strongly plumose scopa of *flavomaculatus*); abdomen less shining, minutely punctured all over.

Known from other Australian *Halicti* by the thoracic patch, the dusky wings, and the black abdomen without hair-bands or spots. The hind spur is finely serrate or denticulate, with numerous little teeth. The posterior truncation of metathorax is well defined, its lateral margins sharp.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 461). Three females.

***Paracolletes fimbriatinus* sp. nov.**

♂. Length about 10 mm.; head and thorax black, covered with bright fox-red hair, that over clypeus dense and shining golden; abdomen rather small, bright ferruginous red, strongly punctured, with a rather marked constriction between first and second segments; face rather broad; mandibles bidentate, black with a reddish spot; tongue colletiform as usual; antennæ ordinary, third and fourth joints about equal, flagellum red beneath; mesothorax and scutellum shining, strongly punctured; area of metathorax triangular, with a strong transverse keel; tegulæ shining clear amber-color; wings clear, faintly dusky at apex; stigma ferruginous, fairly well developed; nervures ferruginous, the outer ones darker; marginal cell flattened, almost truncate, at end; b. n. meeting t. m.; first r. n. joining second s. m. before the middle; legs mainly red, with reddish hair, but femora blackish except apically, and middle and hind tibiæ with a large blackish cloud; hair of abdomen mostly pale reddish, but short fuscous hair on the more or less darkened hind margins of the segments; apex darkened; third to fifth ventrals with broad even fringes of yellowish hair.

Var. a.—Hair of head and thorax pale ochreous.

This species is very near to *P. fimbriatus*, which is known only in the female. The color of the tegulæ and the better developed stigma seem to indicate that *fimbriatinus* is not the male of *fimbriatus*.

Hab.—Victoria (*C. F.*; Turner collection). British Museum). Two males.

Paracolletes turneri sp. nov.

♀. Length about 11 mm.; brilliant blue and green, with the caudal fimbria bright orange-fulvous; head broad, strongly and closely punctured; clypeus and face green, the supraclypeal area and lower part of clypeus with brassy tints; vertex and cheeks mainly blue; hair of face white, dense at sides, of cheeks and occiput also white, but of vertex fuscous; a keel between antennæ; flagellum short, dull reddish beneath; tongue colletiform as usual; mesothorax and scutellum shining green, with strong well-separated punctures, sparse on middle of mesothorax; metathorax blue-green, the basal area smooth and shining; pleura fine dark blue; hair of thorax white, but dark fuscous on scutellum and middle of mesothorax (a broad band between the wings, only evident in lateral view); tegulæ rufous; wings hyaline, a little dusky, stigma and nervures piceous; second s. m. broad, receiving first r. n. well before its middle; b. n. just falling short of t. m.; marginal cell narrowly truncate at apex; legs dark reddish with mostly pale hair; scopa on hind tibiæ dark fuscous on outer side, white on inner; hind basitarsus with a long posterior fringe of white hair; hind spur with eight long spine-like teeth; abdomen shining, finely and very distinctly punctured, the segments green basally and bluer beyond, the first two segments with the disc a splendid purple, beautifully contrasting with the green; hair of abdomen consisting of a short white tomentum, noticeable in lateral view, and thin interrupted yellowish-white hair-bands, hardly noticeable from above, on segments 2 to 4; fimbria brilliant fulvous; ventral segments with pale fringes.

Allied to *P. elegans* (Smith), but readily separated by the brilliant, contrasting and varied colors.

Hab.—Mackay, Queensland, Jan., 1891 (*Turner* 615). British Museum.

Paracolletes cupreus semipurpureus Ckll., var. a.

♀. Abdomen olive-green, strongly tinged with brassy.

Hab.—Mackay, Queensland, May, 1900 (*Turner* 863). British Museum.

Paracolletes providus (Smith), var. a.

Port Philip, Australia (*Coulon*). One of each sex; Berlin Museum. The female differs from Smith's description in having the vertex, posterior middle of mesothorax and middle of scutellum with fuscous hair, and the basal half of scopa on hind tibiæ fuscous above. The flagellum is very obscurely brownish beneath. Hind spur with numerous long spine-like teeth. This has the shining abdomen of *providus*,

but the pubescence is colored more as in *P. versicolor*. There can be little doubt, I think, that it is properly referred to *P. providus*, and even the apparent varietal differences may be due to the brevity of Smith's description. The male is evidently the insect referred to by me (Ann. Mag. Nat. Hist., Nov., 1905, p. 484) at the end of the description of *P. providellus*. The head and thorax are wholly without dark hair above. The hind margins of the abdominal segments are very distinctly reddened.

Paracolletes waterhousei Ckll.

♂. Victoria, Australia (*C. F.*, February, 1901; Turner collection). British Museum.

A species with much bright fulvous hair; apical plate of abdomen pointed.

Paracolletes argentifrons (Smith), var. a.

A male collected by Preiss in Western Australia (Berlin Museum, 2562), accords excellently with Smith's description and my notes on Smith's type, except that the second r. n. enters third s. m. some distance from its end, and the third and fourth ventral segments of abdomen have a fringe of fuscous hair. The abdomen is distinctly and finely punctured.

Paracolletes cæruleotinctus Ckll., var. a.

♂. Kuranda, Queensland (Turner collection). British Museum.

Agrees with type in nearly all respects, but hair of vertex black, apical margin of second abdominal segment with short black hair, abdomen brilliant purple-blue, slightly greenish toward the apex. This may represent a distinct local race.

Paracolletes nigroclypeatus sp. nov.

♀. Length 12 mm.; blue-green, the broad strongly punctured clypeus black, contrasting; mandibles dark; face very broad, with much white hair at sides; hair of vertex largely fuscous, of cheeks white; flagellum bright ferruginous beneath; mesothorax strongly punctured, the punctures running in subconfluent rows; middle of disc purplish, nearly impunctate; anterior part of mesothorax with some yellowish-green tints; area of metathorax with a transverse keel; hair of thorax dull white, with some fuscous on mesothorax, scutellum and anterior part of mesopleura; tegulæ reddish; wings brownish-hyaline, stigma and nervures reddish-brown; b. n. meeting t. m.;

marginal cell narrowly obliquely truncate; second s. m. broad, receiving first r. n. a little before middle; second r. n. joining third s. m. near end; legs dark rufopiceous; scopa of hind tibiae fuscous seen from above, but beneath with very long curled white hair, strongly plumose at ends; abdomen broad, with varied bluish and green tints, very little punctured, the second segment nearly impunctate except for a row of scattered punctures just before the marginal area; no hair-bands; apex with dark fuscous hair; ventral segments fringed with long glittering white hair, only a little stained with fuscous on the fifth; apical plate rounded, not keeled; hind spur with five long spine-like teeth.

Closely related to *P. carinatus* Smith. but larger, with the clypeus black and the fringe on fourth ventral segment white.

Hab.—Victoria, Australia (C. F.; Turner collection). British Museum.

Paracolletes melbournensis sp. nov.

♀. Length about 11 mm.; olive-green, the clypeus and supra-clypeal area strongly punctured, black, with crimson and golden tints at sides and in the vicinity of the suture between them; flagellum ferruginous beneath only at apex; hair of head and thorax ferruginous above, white below, but dark fuscous on vertex, middle of scutellum, and intermixed on disc of mesothorax; face very broad; mesothorax dullish, well punctured, a purplish-black nearly impunctate discal patch; area of metathorax transversely grooved, and with an evident though variable transverse keel; tegulae shining piceous; wing hyaline, nervures and stigma rather dark reddish; b. n. meeting t. m.; first r. n. joining second s. m. in middle; second r. n. joining third s. m. almost at apex; legs black (not at all red); scopa of hind tibiae black on upper outer side, otherwise white; hind basitarsus broadened; hind spur with long spines; abdomen entirely olive-green, with a dullish sericeous surface; apical fimbria black; ventral segments 2 to 4 with pure white fringes, fifth with a yellowish fringe.

Superficially just like *P. cupreus semipurpureus*, var. a, but considerably larger. From *cupreus* proper it is known by the black legs and pure green abdomen. It is also related to *P. amabilis*, but larger, and with the legs differently colored. All these insects form a group of closely related forms, and with the material at present available it is uncertain how many valid species are represented.

Hab.—Melbourne, Victoria (Rolle; Berlin Museum). Another specimen, in poor condition, is from Victoria (C. F.; Turner collection). British Museum.

Paracolletes mimulus sp. nov.

♀. Length about 10 mm.; almost exactly like *P. melbournensis*, but smaller and less robust, with the tibial scopa of hind legs white in front, yellowish behind, wholly pale except some fuscous hair surrounding the knee-plate; stigma and nervures clearer ferruginous, second submarginal cell smaller; flagellum ferruginous beneath except at extreme base; hair of vertex pale ochreous; hind basitarsi, and small joints of all tarsi, ferruginous; hair of thorax above ochreous or pale fulvous, without fuscous; abdomen with golden tints. The transverse keel on the blue-green area of metathorax is distinct.

This is another member of the group just referred to, very close to the others but apparently separable. No doubt these allied forms have different times of flights or visit different flowers.

Hab.—Victoria (*C. F.*; Turner collection). British Museum.

The species of *Paracolletes* discussed in this paper may be separated thus :

- | | |
|---|--------------------------------------|
| Postscutellum with a process | 1. |
| Postscutellum unarmed | 2. |
| 1. Postscutellum process simple..... | dentiger Ckll. |
| Postscutellum process bidentate..... | vigilans (Sm.). |
| 2. Abdomen red..... | fimbriatus Ckll. |
| Abdomen black or dark brown, not metallic..... | 3. |
| Abdomen metallic, bluish or greenish, blue or green..... | 5. |
| 3. Scutellum and postscutellum appearing yellow from a patch of dense hair..... | flavomaculatus Ckll. |
| Thorax not thus ornamented..... | 4. |
| 4. Hair of head and thorax black and white. | |
| | argentifrons (Sm.) var. a. |
| Hair of head and thorax bright fulvous red... | waterhousei Ckll. |
| 5. Apex of abdomen covered with bright fulvous hair... | turneri Ckll. |
| Apex of abdomen without bright colored hair..... | 6. |
| 6. Abdomen olive-green, sometimes with strong brassy tints..... | 7. |
| Abdomen bluish or purplish or blue-green, often dark..... | 9. |
| 7. Scopa of hind tibia almost entirely pale; no dark hair on head or thorax above..... | mimulus Ckll. |
| Scopa of hind tibia with a dark fuscous band extending its whole length; vertex with dark fuscous hair..... | 8. |
| 8. Larger, length about 11 mm..... | melbournensis Ckll. |
| Smaller, thorax above with less dark hair. | |
| | semipurpureus (Ckll.) var. a. |
| 9. Tegument of thorax black | providus (Sm.) var. a. |
| Tegument of thorax metallic green or bluish..... | 10. |

10. Head and thorax above yellowish-green, with coppery tints, and much dark hair; abdomen blue.

cæruleotinctus Ckll. var. a.

Head and thorax above bluish-green or blue.....11.

11. Abdomen with strong green tints; flagellum bright ferruginous beneath; one of the larger species....**nigroclypeatus** Ckll.

Abdomen purple or blue; flagellum less brightly colored, or dark12.

12. Abdomen broader, shining steel blue**plumosus** (Sm.).

Abdomen narrower, duller, dark purple.....**bicolor** (Sm.) var. a.

Euryglossa victoriae sp. nov.

♀. Length about 10 mm.; head and thorax black, the front bluish, the metathorax dark green; legs black with white hair, the knees whitish, small joints of tarsi ferruginous; abdomen broad and flattened, with a satiny lustre, olive-green, with the sides of the first three segments, and a cloud on the fourth, chestnut red, on the second segment the red is very extensive, leaving only the middle third green; venter of abdomen green, the margins of the segments whitish hyaline; hair of head and thorax rather dull white, but that on occiput abundant and strongly yellowish; clypeus flattened, with irregular large punctures; antennæ very dark brown, flagellum reddish beneath, especially toward the apex; front finely roughened; mesothorax pure black with strong but sparse punctures, more or less in rows; scutellum well punctured, its posterior margin vertical; area of metathorax shining; pleura rough and dull, greenish; hind spur strongly dentate; tegulæ light fulvous; wings clear, stigma and nervures ferruginous, venation normal; hair at apex of abdomen fuscous.

Close to *E. tricolor* Smith, but larger, and differing in the details of coloration.

Hab.—Victoria (C. F.). Turner collection. British Museum.

Euryglossa perditiformis sp. nov.

♀. Length about $5\frac{1}{2}$ mm.; light lemon-yellow with dark markings; head broad, yellow; apical third of mandibles dark; antennal sockets depressed, black, united by a dark band curving over supraclypeal area, the dark color also extending as a rounded lobule on each side of the antenna, and also downwards as a short band, the shape of the dark area about the socket resembling a duck's head with the beak pointed downwards; occiput black, and a black band across the vertex, having a pair of triangular projections in front of the ocelli, and an extension part way down the orbits, so that the upper margin of the yellow is trilobed; front smooth and shining; antennæ brown above and yellow beneath; thorax yellow, with the sutures more or less black lined; mesothorax with three very broad longitudinal black bands,

much broader than the intervals between them, the lateral ones claviform; lower part of mesopleura with a large black patch; area of metathorax shining black, with an irregular (lobulate) central yellow spot, the black also continued as a broad band down below the area; tegulæ with a yellow spot in front, bordered by brown and posteriorly testaceous hyaline; wings hyaline, iridescent, nervures and stigma very pale yellowish; lower part of b. n. strongly arched, falling far short of t. m.; first r. n. meeting first t. c.; marginal cell sharply pointed; legs yellow; anterior femora broad and flattened, with a large black mark behind; anterior and middle tibiæ with a dark brown stripe behind; hind tibiæ black and hairy on posterior side; tarsi reddish, hind ones fuscous; abdomen with very broad entire dark brown bands on first four segments, and two large marks on fifth; venter yellow.

Related to *E. quadrimaculata* and *E. calliopsiformis*, but very distinct. It is curiously similar to some species of *Perdita*, especially *P. punctosignata*.

Hab.—Mackay, Queensland, Jan., 1897 (*Turner* 459). British Museum.

***Euryglossa calliopsella* sp. nov.**

♀. Length about 6 mm.; close to *E. calliopsiformis* Ckll., but differing as follows: yellow markings rather pale; clypeus with only lateral (small) black marks; frontal mark subtriangular, broadly connected with supraclypeal; the broad lateral marks reaching as high as top of frontal, obliquely truncate, the longer side inner; sides of prothorax yellow with a narrow black stripe; sides of mesothorax anteriorly with yellow lateral bands, curving round in front and becoming continuous with the longitudinal (discal) yellow lines; lower part of pleura marked with yellow; anterior femora broad, yellow above and in front, middle femora yellow with the lower edge brown; abdomen with very broad yellow bands at bases of segments, that on fifth interrupted; first segment also with a yellow spot on each extreme side; venter fuscous. The hind spur is coarsely serrate.

The venation differs from that of *E. perditiformis*, in that the first r. n. joins the second s. m. a long distance from its base.

Hab.—Victoria (*C. F.*). *Turner* collection. Two in British Museum.

***Euryglossa semipurpurea* sp. nov.**

♀. Length about $3\frac{1}{2}$ mm.; head and thorax black (front and vertex a little brassy), abdomen dark reddish-purple; head broad, antennæ close together, the sockets depressed; front shining; upper part

of clypeus and a contiguous band on supraclypeal area light yellow; mandibles ferruginous except at apex; antennæ ferruginous beneath, scape thick; cheeks shining; mesothorax and scutellum dullish, metathorax shining, no yellow marks on thorax; tegulæ rufo-fuscos; wings quite clear, iridescent, stigma large; second s. m. small; second t. c. in a straight line with second r. n.; first r. n. joining first s. m. a short distance before apex; lower side of first s. m. straight; legs pale reddish, the femora and the tibiæ more or less infuscated; abdomen broad, shining, microscopically transversely lineolate; hind spur coarsely serrate.

This minute species may best be compared with *E. pernana* Ckll., from which it differs at once in the venation and the color of the abdomen. The venation is not normal for *Euryglossa*.

Hab.—Mackay, Queensland, at flowers of *Eucalyptus*, March, 1900 (*Turner*). British Museum.

***Euryglossa jucunda* Smith.**

A female from Mackay, Queensland. Nov., 1893 (*Turner* 867), agrees with Smith's description, but is in poor condition, and has lost the apical half of the abdomen. It is related to *E. subsericea*, but easily separated by the narrower face and bright ferruginous under side of flagellum.

***Euryglossa chrysoceras* Ckll.**

A male from Victoria (*C. F.*; *Turner* collection), in the British Museum agrees with the type, but has the dark parts of the abdomen black, with ferruginous (narrowly) between the black and the whitish hind margins of the segments.

***Euryglossa myrtacearum* sp. nov.**

♀. Length about $6\frac{1}{2}$ mm.; robust, broad, the abdomen cordate; head and thorax black, with dull whitish hair; head broad, front densely punctured, facial foveæ linear; mandibles obscure reddish about the middle; scape dark reddish in front; flagellum ferruginous beneath except at base; mesothorax shining, closely punctured at sides, but on disc sparsely though strongly punctured; scutellum with strong well separated punctures; area of metathorax smooth and shining, its lateral margins with a double curve; tegulæ shining fuscous; wings hyaline, nervures and stigma dull ferruginous; second s. m. large, broadened outwardly, receiving the recurrent nervures near apex and base; lower side of first s. m. curved; lower section of b. n. strongly arched, ending far from t. m.; femora and hind tibiæ very dark reddish brown, the knees ferruginous, the other tibiæ redder, the tarsi clear ferruginous; hind spur with large teeth; abdomen ferruginous with a sericeous (microscopically granular) surface; basal half

of first segment nearly black, and a pair of large dark lobes projecting into the red apical portion; apical segments entirely red.

This may be compared with *E. bicolor* Smith, but it lacks the dark stripes on the abdomen.

Hab.—Mackay, Queensland, at flowers of *Leptospermum*, Oct., 1898 (*Turner* 2a). British Museum.

***Euryglossa salaris* sp. nov.**

♀. Length about 9 mm.; head and thorax black, agreeing in general with those of *E. myrtacearum*, but the punctures of the mesothorax large, with very minute ones between, and the puncturation not very dense anywhere; scutellum sculptured like the mesothorax; area of metathorax shining; face broad, front densely punctured; flagellum ferruginous beneath; tegulæ dark reddish; wings hyaline, nervures and stigma dark reddish-brown; venation as in *E. myrtacearum*, except that first r. n. enters second s. m. distinctly further from base than second from apex; legs black or brown-black, with pale hair, the small joints of tarsi ferruginous; hind spur coarsely serrate; abdomen ferruginous, not so broad in proportion to its length as in *E. myrtacearum*; apical margins of segments with short pale hair forming partial bands; first segment dusky, clouded with reddish, lateral hind margins pallid; second and third segments with a transverse dark discal streak; apical segments and venter light.

Var. a.—Abdomen blackish, slightly metallic, the last three segments red, and slight red shades on second and third, and about base of first.

The mesothoracic punctures are considerably larger in this species than in *E. subsericea*.

Hab.—Mackay, Queensland; type, Nov., 1893 (*Turner* 865), var. a, same date (*Turner* 866).

***Euryglossa subfusa* sp. nov.**

♀. Length about 8½ mm.; head and thorax shining black, with scanty dull white hair; abdomen thick but parallel-sided, clear red, with the first segment and basal half of second bluish-black; clypeus smooth, its lower margin conspicuously fringed with pale hair; a delicate keel between antennæ; front with widely separated punctures; tongue prosopiform; flagellum clear ferruginous beneath; mesothorax and scutellum with fine scattered punctures; area of metathorax shining; tegulæ dark rufo-fuscous; wings hyaline, nervures and stigma fuscous, venation practically as in *E. salaris*; legs black with pale hair, tarsi ferruginous at end; abdomen dullish, sericeous, the red part slightly purplish in certain lights, the apical segments wholly red.

Hab.—Port Darwin, Australia, Dec., 1902 (*Turner*). British Museum.

Euryglossa pavonura sp. nov.

♀. Length about 10 mm.; head and thorax black, but the front greenish, the vertex bluish, and the metathorax distinctly metallic; clypeus shining, with sparse shallow punctures; front with strong well-separated punctures; the linear facial foveæ reaching downwards to level of antennæ; mandibles dark; middle of flagellum marked with yellowish beneath; mesothorax shining, with strong punctures, widely separated on disc; area of metathorax shining; tubercles densely fringed with white hair; pleura bluish: tegulæ piceous; wings hyaline, nervures fuscous, the outer ones pallid; stigma unusually small; venation normal, first r. n. entering second s. m. a considerable distance from base; legs black, with pale hair, hind spur dentate; abdomen above brilliant peacock-green, with varying shades, bluer and yellower; fifth segment fringed with fuscous hair; venter much darker.

A very distinct and beautiful species.

Hab.—Cooktown, Australia, April, 1902, two females (*Turner*). British Museum.

The following table will be useful for the separation of a number of species of *Euryglossa*.

Extremely small (about $3\frac{1}{2}$ mm. long); face of female with a large light spot; lower side of first s. m. straight; first r. n. entering s. m.; second s. m. small (subgenus <i>Euryglossina</i> nov.).....	semipurpurea Ckll.
Not thus minute; first r. n. not entering first s. m.	1.
1. Mesothorax black, striped with yellow.....	2.
Mesothorax not striped.....	3.
2. First r. n. joining first t. c.	perditiformis Ckll.
First r. n. joining second s. m. a considerable distance from base.	calliopsella Ckll.
3. Mesothorax red.....	4.
Mesothorax dark.....	6.
4. Abdomen dark.....	ephippiata Smith.
Abdomen red.....	5.
5. Fifth abdominal segment black	leptospermi Ckll.
Fifth abdominal segment red	frenchii Ckll.
6. Clypeus yellow; first r. n. meeting first t. c.	sinapipes Ckll. (male).
Clypeus dark	7.
7. Males	8.
Females	10.
8. Flagellum bright ferruginous; hind margins of abdominal segments broadly subhyaline	chrysoceras Ckll.
Flagellum dark, at most obscurely reddish beneath.....	9.

9. Larger ; head and mesothorax greenish **subsericea** Ckll.
Smaller ; head and mesothorax black **reginæ** Ckll.
10. Abdomen brilliant peacock-green ; large species.
pavonura Ckll.
Abdomen not thus colored 11.
11. Occiput conspicuously covered with yellowish-white hair, so that
at a glance the upper border of the prothorax seems to be
light yellow as in some *Prosopis* ; abdomen green and red.
victoriæ Ckll.
Occiput not thus ornamented 12.
12. Abdomen red (sometimes clouded with dark in *salaris*) 13.
Abdomen not red 15.
13. Mesothorax very little punctured ; base of abdomen dark purplish.
subfusa Ckll.
Mesothorax well punctured 14.
14. Smaller ; basitarsi clear red **myrtacearum** Ckll.
Larger ; basitarsi not red **salaris** Ckll.
15. Flagellum dark, at most slightly reddish beneath.
subsericea Ckll.
Flagellum bright ferruginous beneath 16.
16. Large and robust ; wings reddish ; stigma and nervures ferru-
ginous **schomburgki** Ckll.
Smaller, face rather narrow ; stigma dark **jucunda** Smith.

Megachile sculpturalis Smith.

A female from Chusan Island (*Walker*), in the British Museum, appears to represent a slight variety of this species, having the apical part of the ventral scopa nearly a pure black. I believe that *M. montonii* Gribodo is a synonym of this species; it is at least extremely closely allied.

The following table will be useful for the separation of female *Megachile* from China, Korea and Mongolia, but the recorded species must represent only a small fraction of those existing :

- Ventral scopa white; legs red.....**chinensis** Rad.
Ventral scopa red or fulvous1
Ventral scopa dark brown, with black hairs; mandibles not dentate.
koreensis Rad.
Ventral scopa black; length 26-27 mm.2.
Ventral scopa bicolored.....3.
1. First three abdominal segments dusky ocher-yellow haired; length
12 mm.**mongolica** Mor.
Metathorax and first abdominal segment white-haired; length 16
mm.**relata** Smith.

2. Abdomen with hair all black beyond first segment.

monticola Smith.

Abdomen with white apical hair-bands on segments 2 to 5.

rhinoceros Mocs.

3. Sides of face with pale hair; abdomen with metallic tints.

remota Smith.

Hair of face all black4.

4. Smaller; sides of thorax with light hair**humilis** Smith.

Larger, 19-21 mm.; thorax with fulvous hair above.

sculpturalis Smith.

M. monticola and *rhinoceros* have a process on the clypeus, and are related to *M. tuberculata*. *M. sculpturalis* has the abdomen slightly metallic.

Gronoceras catulus sp. nov.

♂. Length about 15 mm., gray, like a small *G. felina* (Gerst.); in all respects nearly as in *felina*, but very much smaller, with the hair of the abdomen, between the bands, pale like the bands, though less dense (some long black hairs intermixed just before the bands), so that the abdomen appears much less distinctly banded than in *felina*. Friese describes two smaller species allied to *G. felina*, namely *laminata* and *armatipes*; *laminata* male differs at once from *catulus* by the simple legs and the color of the thoracic hair; *armatipes* male has red mandibles, and the abdomen seems to be different.

Hair of face arranged and colored as in *felina*, yellowish-white with some dark hairs intermixed; mandibles black, formed as in *felina*, with the same large lobe beneath, but somewhat elbowed about the middle; blade of maxilla striate as in *felina*; antennæ black, third joint shorter than fourth, apical part of flagellum grooved beneath; hair of head and thorax above white mixed with black, the black less abundant than in *felina*, the whole effect paler; wings clear, a little dusky at apex; as in *felina*, the b. n. falls short of t. m.; legs formed and colored (including hair) as in *felina*; anterior coxæ with two spines, one long and one short; anterior tarsi flattened, yellowish, the basitarsus with a dusky spot as seen from above, but from beneath it is intense black on a white ground, ocellus-like; lateral hair-fringe largely blackened; middle tibiæ with long white hair behind; middle tarsi with a great fringe of dark fuscous hair, spreading on either side; hind tibiæ with dark fuscous hair behind; claws bifid; apex of abdomen, as in *felina*, with long white hair, and a longer black brush, and the usual pair of long stout spines.

Hab.—"Maziwa Mitatu and Maungu, March 14 and April 4, 1897," British East Africa (*C. S. Betton*). British Museum.

***Anthidium chubuti* sp. nov.**

♀. Length about 13 mm., anterior wing 9, width of abdomen a little over 5 mm.; black, with the antennæ, tegulæ, apices of femora (greater part of upper side of anterior ones), tibiæ and tarsi all bright red, these red parts with red hair, and also a tuft of red hair below anterior end of tegulæ; pubescence otherwise black, except on vertex, mesothorax and scutellum, where it is pale tawny (some black along hind margin of the rather projecting scutellum); the long red hair of scape contrasts curiously with the black of face; mandibles black with a red subapical spot, apical tooth large, inner teeth smaller and alike, five in number; no light face-markings, but vertex behind the ocelli with a cream-colored band, broad in the middle, tapering at either end; thorax without light markings; mesothorax and scutellum densely punctured; anterior wings with the basal half orange, with orange nervures, the apical half yellowish dusky, the outer nervures dark fuscous; second r. n. meeting second t. c.; no pulvillus; end of abdomen with a sharp tooth on each side; first five segments each with a pair of cream-colored marks, those on the first two elongated, and quite lateral, the others becoming shorter and rounded and closer together, the last pair separated by an interval less than the diameter of either; ventral scopa black.

Hab.—V. del Lago Blanco (misprinted Xanco on label), Patagonia (*Chubut*). British Museum. Closely related to *A. steloides* Spinola, from Santiago, Chile, but considerably larger and more robust, and differing in details of coloration. Another close ally is *A. rubripes* Friese, from the Argentine, but this is narrower and otherwise different. Brethes (1909) has transferred *A. rubripes* to *Dianthidium*, but from the description it is evidently near *A. steloides* and *chubuti*, and Jörgensen gives an account of the nest, which shows that it cannot be a *Dianthidium*.

***Anthidium flavipes* Morawitz.**

This species was described from Central Asia. A male in the British Museum is from Perim Island, in the Straits of Bab-el-Mandeb. I have never seen authentic *A. flavipes*, but the Perim Island specimen agrees so closely with the description that it is impossible to separate it. It differs in being a little larger, fully 9 mm. long. The second r. n. goes well beyond the apex of second submarginal cell, and from

its evident affinities the insect ought to be a *Dianthidium*, but the feet are without pulvilli. The hind trochanters are strongly toothed, the axillæ are feebly toothed, and the apex of the abdomen resembles that of *A. latreillei*. The abdomen is yellow with light red bands along the hind margins of the segments. The eyes are light reddish.

***Dianthidium (Anthidiellum) truncatiforme* sp. nov.**

♂. Length about $5\frac{1}{2}$ mm.; very short and compact; clypeus, lateral face-marks (extending nearly to lower level of antennal sockets), and mandibles except teeth, brownish-white, the color nearly as in *D. strigatum*; thorax all black; edge of head above with a linear yellow band widely interrupted in the middle; tegulæ shining black with a yellow spot; wings strongly infuscated; second s. m. much longer than first, reciving first r. n. near base, the second r. n. going beyond its apex; anterior and middle femora with a yellow stripe beneath; tibiæ all yellow on outer side, and largely on inner; middle basitarsus with a yellowish stripe; hind basitarsus bulging near base; ends of tarsi becoming ferruginous; hind tarsi with hair white on outer side and orange on inner; abdomen with large bright yellow marks on all the segments, becoming closer on each segment after the first, just as in *D. truncatum*; fifth segment yellow with a median dark line, sixth yellow: apex with two small hyaline teeth, widely separated. Mandibles tridentate; antennæ dark; scutellum projecting, with a very broad sharp edge, the lateral corners of which are triangular.

Very close to *B. truncatum* Smith, but the face-markings are differently colored (yellow in *truncatum*) and the lateral marks are longer (not reaching level of top of clypeus in *truncatum*). The clypeus is much higher than in *D. strigatum*.

Hab.—Tamsoo, Gold Coast, Africa. (British Museum, 1900-123.) I have only seen the female of *D. truncatum*, but Friese describes the male, and cites no difference in the face-markings; he states that abdominal segments 6 and 7 are black.

***Habropoda festiva* Dours.**

Basutoland, Africa (*R. Crawshay*). British Museum.

***Habropoda bettoni* sp. nov.**

♂. Length 16 mm. or rather over; general aspect of *H. festiva*, but abdomen even a little narrower (about 5 mm. broad), with much narrower hair-bands; hair of head, thorax and first abdominal segment fulvous, as in *H. festiva*; head, with large eyes, as in *festiva*; ocelli

in a very deep triangle; third antennal joint longer and more slender than in *festiva*; scape mainly cream-colored beneath; clypeus, labrum and mandibles pale yellow, marked as in *festiva*, except that in the middle of the clypeus is a very large semicircular black mark; hair at apex of labrum pure white (partly orange in *festiva*), and basal spots of labrum evanescent; thorax considerably smaller than in *festiva*; tegulae dark rufo-fuscous; wings as in *festiva*, but uniformly suffused with reddish-dusky, and the first s. m. shorter, distinctly shorter below than the second; hair of legs creamy-white; anterior basitarsus with an immense tuft behind, which when seen from beneath is white and concave basally, followed by a black band, while the long outer hairs are black and fawn-color; anterior femora ferruginous, flattened and twisted, with very long hairs behind, and a curious specialized patch of hair, occupying a lanceolate depression, anteriorly on the apical half; middle femora deformed, with a great tuft of hair beneath; middle tibiae with an obtuse red (black-edged) apical tooth; middle basitarsus flattened, broadened to the apex, with a very obtuse anterior tooth; hair on inner side of middle tarsus black at base, red beyond; hind femora very thick, flat and nude beneath; hind tibiae thick, with a triangular red apical tooth; hair on upper side of middle and tibiae creamy-white; hind basitarsus triangular, broad apically, flattened, shining, dark reddish, the posterior apical corner briefly denticiform (no strong tooth such as occurs in *festiva*); hair on inner side of hind basitarsus thick, appressed, rich dark red; last joint of hind tarsi long; basal segment of abdomen with brilliant orange-fulvous hair; the bands on remaining segments narrow, that on second pale fulvous, on third paler, on the others practically white; sides of sixth segment with long black hairs overlapping the white; apex with black hair; subapical ventral hair seal-brown and white.

Hab.—British East Africa (*C. S. Betton*). British Museum. A very distinct and remarkable species, allied to *H. festiva* and *H. determinata* (*Anthophora determinata* Friese). The marginal cell in these insects is longer than in typical *Habropoda*.

***Morgania appletoni* sp. nov.**

♀. Length a little over 5 mm.; head and thorax shining black, with minute, well separated punctures; labrum a little longer than broad, dark reddish; mandibles ferruginous, simple; malar space absent; eyes very pale reddish, very broad below; face with short silvery-white hair; scape ferruginous, flagellum dark, except at base; præflagellar joint well differentiated, oval; ocelli as in *Pasites maculatus*; sides of thorax, and metathorax except the smooth and shining middle, with much white hair; tubercles, and a spot on each extreme side of metathorax, ferruginous; scutellum moderately prominent, hardly bigib-

bous, smooth with scattered strong punctures; legs ferruginous, including coxæ, with short white hair; spurs ferruginous; tegulæ large, shining rufo-fulvous; wings slightly dusky, darker apically, stigma and nervures piceous; b. n. going a little basad of t. m.; marginal cell obliquely truncate, appendiculate; both recurrent nervures entering second s. m., the second as far from first as the first from base of second s. m.; abdomen shining clear ferruginous, the first two segments with a purple iridescence; white hair-patches at sides of second segment and a little white hair on segments beyond; apical plate very broad.

Easily known from *M. dichroa* by the small size, clearer wings, etc.

Hab.—Bohotle, Somaliland, Africa (*Vety. Major A. F. Appleton*). British Museum. The *M. dichroa* mentioned above is Smith's species, but it seems that there is an earlier *M. dichroa* (Spinola), of which *carnifex* Gerst., is a synonym; consequently Schulz renamed Smith's insect, which, accepting the priority of *Morgania*, must stand as *Morgania gerstackeri* (Schulz).

Pasites friesei n. n.

Pasites ater Friese, Kilimandjaro-Exped viii (1908), p. 148, (not *P. atra* Latr.).

Crocisa guineensis Rad.

Sierra Leone, W. Africa, Nov., 1904 (*Major F. Smith*). British Museum.

Crocisa prætexta Vachal.

Lagos, W. Africa (*H. Strachan*). British Museum.

The above two species of *Crocisa* agree with the too brief descriptions of the species to which they are attributed. They are very much alike, and also very like *C. picta*, but evidently distinct. The following characters (based on females) may be added to those previously published.

C. guineensis.—Hind wings evidently infuscated apically; abdominal markings turquoise-blue; hind margin of prothorax with an interrupted band of light blue hair, the adjacent parts of mesothorax black haired.

C. prætexta.—Hind wings scarcely infuscated apically; abdominal markings very pale blue; the two large bluish-white marks of thorax anteriorly partly on prothorax and partly on mesothorax.

Crocisa grahami sp. nov.

♀. Length $9\frac{1}{2}$ mm.; scutellum W-like, all black, but white hair projecting from beneath the emargination; markings pale blue; wings very dark, violaceous with hyaline spots; face with bluish-white hair, the lower part of clypeus bare; lower half of pleura abruptly bare; more than the basal half of hind tibia light haired. The light markings on the thorax are of the usual pattern, with a broken band in front, a short anterior median longitudinal band (separated from anterior margin), a spot on each side of the last, a pair of lateral longitudinal bands, which are short and do not connect with the two large spots just anterior to the scutellum. The abdominal markings consist of broadly interrupted (squarely cut off) bands, and on the first segment a large lateral mark on each side, broadly emarginate or excavated within, its lower lobe representing the bands on the other segments.

Related to *C. lanosa* Friese, but not long-pilose. The abdominal markings are as in the much larger *C. guineensis*.

Hab.—Obuasi, Ashanti, Africa (*Graham*). Cambridge University Museum.

Ceratina (Ceratinidia) ridleyi sp. nov.

Length about 10 mm., black with light yellow markings; wings reddish dusky.

♂. Head and thorax shining, antennæ inserted in a wide basin, which is bounded by a strong ridge below and at sides, the lateral ridges contiguous with the eyes; face below antennæ yellow, except a black stripe down each side of the square upper half of the clypeus, and narrowly along the upper edge of clypeus, and the supraclypeal area black except a broad transversely oblong mark just above the clypeus; labrum yellow with two dark spots, and strong sparse punctures; mandibles yellow with the tridentate apex black; cheeks yellow; antennal basin divided in the middle by a longitudinal keel; a pair of yellow spots, almost touching, below the anterior ocellus; a pair of elongate yellow marks on upper side of head; antennæ piceous, scape yellow in front, flagellum thick, last joint somewhat pointed; mesothorax with the anterior half roughened and punctate, the posterior smooth and shining; the yellow markings of thorax consist of four stripes (the middle ones narrow) on mesothorax, prothorax above, and descending stripes, most of tubercles, mesopleura except posterior margin (broader above), scutellum, axillæ, band on postscutellum, and base of metathorax very broadly; femora, tibiæ and tarsi yellow, but the middle femora suffused with blackish, and the hind ones with rather more dark than light; inner side of hind tarsi with pale golden hair; tegulæ shining rufotestaceous; wings hairy, nervures and stigma dark reddish; abdomen shining basally, rugose apically, second and third segments distinctly but sparsely punctured; first segment with

two yellow spots on disc, and a yellow apical band, interrupted in the middle and enlarged on each side; second segment with a yellow apical band narrowed and evanescent medially, but enlarged to broad triangles at sides, the enlargement being, however, nearly all on the base of the third segment, and so not really part of the band; third to fifth segments with basal bands enlarged at sides and failing in the middle; apical dorsal segments with fuscous hair, but venter with pale hair; apex truncate, the truncation tridentate or trituberculate, *i. e.*, with angular corners and a median tubercle; venter mainly yellow toward the base.

♀. Similar, but antennal basin less evidently bounded; upward extension of lateral face-marks better developed, going broadly up sides of front nearly to top of eyes, and enlarged opposite supraclypeal area; supraclypeal mark smaller; scape merely reddish; broadly triangular area of metathorax black, the rest yellow; middle and hind femora and hind tibiae dark, but the knees light; anterior femora largely brown; light parts of legs a sort of yellowish-testaceous; first abdominal segment yellowish with a broad suffused brown band; second segment with broad basal and apical pale bands; fifth with an apical band; sixth light spotted; sides of third showing a basal band; lower part of mesopleura dark.

Hab. Singapore (*H. N. Ridley*). British Museum. In Bingham's table (Fauna of British India, Hymenoptera, vol. 1, p. 500) this runs to *C. moderata* as nearly as anything, but that is only half the size. It is, of course, related to *C. hieroglyphica* Smith, but is easily distinguished by the large hairy wings, the great development of yellow on the face, the large amount of yellow on the pleura, etc. By the yellow mandibles it is related to *C. flavipes* Smith, from China, but that is a much smaller species. It is also related to *C. flavopicta* Smith, from Sarawak; perhaps nearer to *flavopicta* than to any other, but that has the basal and apical segments of the abdomen, and the apical margins of the others, yellow.

***Ceratina samburuensis* sp. nov.**

♀. Length about or almost 10 mm.; steel-blue and green, very strongly punctured; face below antennae olive-green, with a very large yellow hat-shaped clypeal mark, the crown of the hat broadest at the top, cut off squarely, its breadth greater than the distance from either corner to the eye, the basal lateral process thick and obtuse; labrum and mandibles black, the latter strongly curved, bidentate at apex; vertex blue, shading into the green of the cheeks; scape and base of flagellum chestnut-red; thorax blue above, greener at sides; tubercles

yellow; middle of mesothorax with smaller punctures than lateral fields; base of metathorax dullish, except a narrow basal band crossed by ridges, tegulae small, ferruginous; wings dusky, nervures and stigma (which is narrow) ferruginous; legs largely dark chestnut-red; the anterior knees, spot near apex of anterior femora behind, basal streak on their tibiae, large basal mark on hind tibiae, and most of hind basitarsus yellow; hind legs with much silver-white hair; abdomen green, constricted laterally at the sutures; sides of apical segment minutely denticulate; ventral hair white, except a minute tuft of yellow at extreme apex.

Related to *C. nasalis* Friese, but easily separated by the face-markings and the sculpture of the mesothorax. The eyes, in the dry state, are light ferruginous, those of *nasalis* are black.

Hab.—Samburu, British E. Africa, Oct. 30 to Nov. 20, 1896 (*C. S. Betton*). British Museum.

***Nomia crawshayi* sp. nov.**

♀. Length 14 mm., expanse about 28; black, densely rugoso-punctate; head and thorax with rather short dull grayish hair, tinged with ochreous dorsally, with black bristles intermixed on scutellum and posterior half of mesothorax; mandibles black, with a faint reddish spot about the middle; labial palpi with first joint about as long as the following three united; flagellum, especially the apical half, dark ferruginous beneath; third antennal joint a little shorter than fourth; tegulae moderate, rufotestaceous; wings yellowish, the apical margins broadly and conspicuously infuscated; b. n. meeting t. m.; second s. m. square, receiving first r. n. a little beyond the middle; third s. m. longer than first; legs black with light yellowish hair; middle femora with a large ferruginous patch in front; hind femora red, clouded with black apically; hind tibiae red; hair on inner side of hind basitarsus largely black or nearly so, but partly red; spurs red; abdomen with broad bands of appressed felt-like hair on hind margins of segments 1 to 4, the first narrower and paler, the other three very broad and bright warm yellowish-ferruginous; basal parts of the segments densely punctured and minutely tuberculate; fifth segment and apex with black hair, but red at sides of fifth; apical plate very narrow; hind margins of ventral segments with the tegument ferruginous.

Apparently related to *N. theryi* Gribodo, of which only the male is known, but differing in the color of the tegulae and other details.

Hab.—Basutoland, Africa (*R. Crawshay*). British Museum.

Judging from the description, it seems rather probable that *N. flavofasciata* Friese, is the same as *N. binghami* Ckll. If so, the latter has about a month priority.

***Nomia basutorum* sp. nov.**

♀. Length $10\frac{1}{2}$ mm., expanse 20; black, head and thorax densely rugosopunctate, with scanty short gray hair; face very broad, eyes converging below; tongue slender, not very long; mandibles red in middle; lower edge of clypeus with orange bristles; antennæ entirely black, scape long, *flagellum thick and very short*; hind ocelli much closer together than either is to eye; front and vertex much more coarsely sculptured than mesothorax; area of metathorax with a strong transverse ridge, bounding a shining channel which has feeble transverse raised lines; tegulæ moderate, ferruginous with the margin pallid; wings strongly infuscated, very dark, the broad apical margin a little darker; b. n. meeting t. m.; first r. n. joining second s. m. almost at its end, or about the beginning of its last fourth; third s. m. rather shorter than first; legs black and red, with golden hair; the red parts are the knees, the greater part of the anterior tibiæ, the middle tibiæ at base and apex, the hind tibiæ, and all the tarsi, but the hind basitarsus with a large subquadrate fuscous patch on outer side; hind basitarsus broad; spurs clear red; abdomen finely punctured, the hind margins of the segments brownish; second and third segments with white marginal hair-bands at sides only, but fourth with an entire narrow band; fifth with a broad fringe of light golden-reddish hair; venter with reddish hair.

An ordinary looking species, but easily recognized by the short thick flagellum, the dark wings and the venation. There is a rather strong general resemblance to *N. wellmani* Ckll., but that species has quite different abdominal hair-bands, a more coarsely sculptured mesothorax, etc.

Hab.—Basutoland, Africa (*R. Crawshay*). British Museum.

***Nomia nana* Sm. (*ruficornis* Sm.).**

A male labelled *N. W. Australia* (*C. F.*; Turner collection), does not differ from one collected at Adelaide. This is a suprising extension of range.

***Nomia australica regis* subsp. nov.**

♂. Agrees with *N. australica*, except as follows: scape and flagellum both dark, each with a very obscure reddish spot beneath at base; hair of face, occiput and cheeks white; wings clearer, hardly at all dusky; abdomen narrower basally, dark purple-blue, not greenish, the hair-bands white, only slightly tinged with yellowish.

Hab.—N. W. Australia (*C. F.*; Turner collection). British Museum.

***Nomia tomentifera* (Friese).**

♂. Cairns, Queensland, "Kur. 2. 02" (*Turner*); female, Cooktown, Oct., 1902 (*Turner*). British Museum. Superficially much like *N. semiaurea* Ckll., but easily known by the dentate postscutellum (metanotum, Friese has it), and the mesothorax in both sexes with a large bilobed dark area, surrounded by short dense ochreous tomentum. The hind legs of the male are simple. Friese describes this as a variety of *N. cincta* Sm., but Smith mentions no postscutellar tooth in *cincta*, which is from Key Island. The tongue in *tomentifera* is linear and quite long, entirely different from the broad dagger-shaped organ of *N. australica regis*.

***Nomia kurandina* sp. nov.**

♂. Length about 9 mm., expanse about 16; shining black, with black and white hair, the wings hyaline, faintly dusky, with the apex of the anterior pair dark fuscous, forming a very conspicuous subtriangular spot, by which the species is easily recognized; face covered with white hair, narrow, eyes converging below; vertex with black hair; lower margin of clypeus broadly dull white, the actual edge narrowly ferruginous; tongue rather long, linear; antennæ long, simple, entirely dark; mesothorax well punctured, shining, with short inconspicuous mostly black hair; scutellum strongly bigibbous, with much black hair; postscutellum unarmed, with dense white hair; base of metathorax with a very sharply defined transverse channel, which is shining and crossed by little ridges; tegulæ rather large, piceous with an obscure pallid spot; lower section of b. n. strongly arched, falling short of t. m.; second s. m. very small, receiving first r. n. very near its end; legs black, with white hair, black bristles at apices of hind tarsal joints; hind femora thick, excavated, transversely flattened and shining beneath; hind tibiæ broadened, subtriangular, produced at apex, flattened on inner side; abdomen shining with fine punctures of two sizes; first and second segments with thin white hair-bands at sides, third with a very broad entire band, apical segments with much coarse black hair; fourth ventral with a median raised line.

Related to *N. gilberti* Ckll., but easily separated by the apical wing-spots.

Hab.—Cairns, Queensland, "Kur., 11. 01" (*Turner*).

***Nomia pseudoceratina* sp. nov.**

♂. Length about $8\frac{1}{2}$ mm.; black, slender, with a shining, clavate abdomen, the hind margins of the segments testaceous, and covered

with pale ochreous hair-bands; head a little broader than long; mandibles largely dark reddish; face covered with ochreous hair; tongue short, broad basally, rapidly narrowing to the finely linear apical part; flagellum dull ferruginous beneath; mesothorax and scutellum strongly and closely punctured; hair of thorax above short, pale ochreous, dense on postscutellum and upper border of prothorax; hair of pleura shining yellowish; area of metathorax ill-defined, plicatulate; tegulæ small, shining dark rufous; wings dusky yellowish; b. n. meeting t. m., its lower section only faintly arched (not at all as in *Halictus*); second s. m. rather large, receiving first r. n. a little beyond middle; stigma large, dark reddish; legs very dark reddish, the tarsi ferruginous; hind legs slender, not deformed, the tibiæ somewhat produced at apex in front, the projecting angle ferruginous; first abdominal segment much longer than broad, distinctly punctured; on the other segments the sculpture becomes more indefinite; disc of fourth ventral covered with ochreous tomentum.

Not a typical *Nomia*; it belongs to a Malayan group, and is almost identical with *N. ceratina* (Sm.) from Sarawak; *N. clavata* Sm. from Gilolo is also allied. Perhaps all these insects are geographical forms of a single species.

Hab.—Mackay, Queensland, Jan., 1901 (*Turner*). British Museum.

***Nomia hypodonta* Ckll., var. a.**

Male flagellum dull reddish beneath. Mackay; Queensland, March, 1900 (*Turner* 697). The basal nervure is strongly arched, *Halictus*-like, but the insect is a *Nomia*.

***Nomia stalkerii* sp. nov.**

♂. Length about 10 mm.; black, head and thorax with abundant pale hair, white below, faintly yellowish dorsally; head broad; face densely covered with creamy-white hair; mandibles with the apical half ferruginous; tongue of the long and linear type; vertex dullish, very finely punctured; antennæ short for a male, the flagellum less than 3 mm., ferruginous beneath; mesothorax hairy, but not so as to hide the closely punctured surface; metathorax with the usual area consisting of a transverse band, obtusely angled in the middle, weakly cross-striate; tegulæ moderate, dark at base, otherwise pallid; wings strongly dusky, stigma dark ferruginous, nervures fuscous; lower section of b. n. well arched, meeting t. m.; second s. m. small, receiving first r. n. beyond the middle; legs black, with light hair; anterior tibiæ in front, and ends of claw-joints, ferruginous; hind tibiæ very hairy; hind legs not deformed; spurs clear ferruginous; abdomen

shining, minutely punctured, but punctures of first two segments much larger than those on third; hind margins of second and following segments (successively broader) whitish-hyaline, with long glittering hairs not constituting definite bands; venter with much white hair.

Very close to *N. tenuihirta* and *N. gilberti*, but known by the darker wings, red spurs, etc.

Hab.—Alexandria, Australia, April, 1906 (*W. Stalker*). British Museum.

***Nomia melanoptera* sp. nov.**

♀. Length nearly 10 mm.; black, rather robust, with white and black hair; face covered with grayish-white hair; eyes strongly converging below; a more or less evident raised line from supraclypeal area down middle of clypeus; lower margin of clypeus with some fuscous hairs; tongue of the long and linear type; vertex dull and granular; antennæ wholly dark; mesothorax shining, not hidden by hair, with strong punctures of two sizes; scutellum somewhat bigibbous; mesothorax and scutellum with scattered black bristles, evident in lateral view; postscutellum with a band of pure white tomentum; metathoracic channel shining, the transverse wrinkles few and irregular, below the channel the lower part of the enclosure appears as a triangular smooth and shining space; tegulæ rather large, piceous; wings fuscous, unusually dark, though subtranslucent, the apex darker; basal section of b. n. very strongly arched, falling short of t. m.; second s. m. very small and narrow, receiving the first r. n. at its apical corner; legs black, with white hair on femora, and much coarse black hair on tibiæ and tarsi, outer side of tibial scopa pure white; a pencil of orange hair at end of hind basitarsus; spurs dark; abdomen shining, with very fine indistinct punctures; complete white hair-bands on segments 3 and 4, a thin band on 2, and a little patch on each side of first segment; margins of segments not at all discolored.

Very similar to *N. stalker*i, *gilberti* etc., but distinguished by the very dark wings, dark spurs, feebly sculptured abdomen, etc.

Hab.—Cairns, Queensland, "Kur., 1. 02" (*Turner*). British Museum.

***Nomia muscosa* sp. nov.**

♀. Length about 10 mm., black; superficially just like *N. melanoptera*, but easily separated by the following characters: mesothorax covered with a grayish moss-like tomentum, which appears black-speckled from the origin of many bristle-like black hairs; area of metathorax quite different, the apical triangle dull, and not cut off from the very narrow finely cross-ridged basal band; tegulæ reddish;

wings not nearly so dark; b. n. less strongly arched below, almost reaching t. m.; second s. m. larger, receiving r. n. not so near end; outer side of anterior tibiae with pale hair; first abdominal segment with well defined punctures, as also the second, third with punctures of two sizes; scattered glittering white hair, but no well-defined bands; apex with dark fuscous hair. The spurs are black.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 698).

***Nomia flavoviridis* Ckll.**

Five males from Cooktown, Australia, October, 1902 (*Turner*). British Museum.

Two females from Mackay, Queensland, at flowers of *Cassia*; Dec., 1899 (*Turner*). Also two females distinctly larger than the Mackay insect, one olive-green, including the abdomen, from N. W. Australia (*C. F.*; *Turner* collection), the other blue-green, from New South Wales (*C. F.*; *Turner* collection). These larger specimens also have the wings rather darker, and seem to constitute a distinct race. The tongue of *flavoviridis* is dagger-shaped.

I cannot avoid a suspicion that the "C. F." specimens from "N. W. Australia" are wrongly labelled. They seem, at least in the main, to represent a S. E. Australina fauna.

***Halictus albofasciatus* Smith.**

This species was described only from the female; I have examined Smith's type and have before me a male, presumably conspecific, from Basutoland (*R. Crawshaw*); British Museum.

♀.—A rather large species, with four broad ivory-white apical bands on abdomen; hair of thorax above ochreous; hind spur minutely nodulose.

♂.—Length about $10\frac{1}{2}$ mm.; hair pallid throughout, only faintly tinged with yellowish dorsally; abdomen with five white tegumentary bands; segments beyond the third with a good deal of brownish-black hair, antennal joints 4 to 10 having beneath successively smaller shining patches, the outline of the affected part beneath crenulated.

All of Smith's 1879 *Halicti*, as well as numerous other species of African bees, are omitted from Friese's recent great work, "Die Bienen Afrikas."

***Halictus galpinsiae* Ckll.**

Utah Junction, Colorado, at flowers of *Anogra*, May 26, between 7 and 8 a.m. (*Cockerell*).

Halictus rowlandi sp. nov.

♀. Length a scant 5 mm.; head black, with the clypeus (except its upper border), labrum and middle of mandibles ferruginous; front moderately shining, but sides of vertex brilliant; hair of head and thorax white, very scanty and short; scape long, curved, light ferruginous beneath, flagellum very obscurely reddish beneath; tongue short dagger-shaped; *thorax and legs entirely light rufofulvous*; area of metathorax ill-defined, plicatulate at base; mesothorax microscopically tessellate, with scattered very weak punctures; hind spur simple (microscopically ciliate); tegulæ pale testaceous; wings hyaline, faintly dusky, iridescent, the very large stigma and the nervures dark brown; b. n. falling a considerable distance short of t. m.; outer nervures weakened; first r. n. entering apical corner of second s. m., the exact position variable; third s. m. very small and narrow, smaller than second; abdomen broad, shining light rufofulvous or rufotestaceous, hind margins of the segments narrowly infuscated, and a slight general dusky suffusion on the apical half; apical segment dark, the rima reddish.

A very distinct little species, totally different from all others by its peculiar coloration, which recalls that of the wasp, *Pison melanocephalum* Turner, also found at Cairns.

Hab.—Cairns, Queensland, "Kur. 2. 02," two ♀s (*Rowland E. Turner*). British Museum.

Halictus cyrei sp. nov.

♀. Length a little over 5 mm.; head and thorax yellowish-green, abdomen and legs bright apricot-color; wings hyaline, stigma and nervures pale yellowish-brown, outer nervures of third s. m. and third discoidal evanescent; mesothorax granular. Face pruinose with short white hair; lower margin of clypeus rather broadly black; front minutely granular; labrum pale reddish; mandibles light yellow except apex and base; antennæ ferruginous, apical half of scape above, and flagellum above suffusedly, infuscated; scutellum brassy, contrasting with the pure green of the mesothorax; area of metathorax broad, ill-defined, obliquely wrinkled; posterior truncation with a sharp lateral edge nearly to the top, tegulæ clear testaceous; third s. m. about as broad as second, second receiving first r. n. some distance from end; tubercles light yellow with a dark mark; coxæ dark; abdomen smooth and shining, with very shanty pale hair.

In my table of Australian *Halicti* (Ann. Mag. Nat. Hist., Sept., 1904) this runs to 11, and runs out because the abdomen is all red, except a very small dark spot on extreme lateral margins of segments 3 and 4. By the black spots at sides 3 and 4 it resembles *H. punctatus exlautus* Ckll., but is

easily separated from that by the granular, minutely punctured mesothorax, and the green metathorax and pleura.

Hab.—Mackay, Queensland, at flowers of *Eugenia*, Nov., 1899 (*Turner* 7a). This and the following species are named after men who are or were connected with Australian science.

***Halictus tatei* sp. nov.**

♀. Length about 5 mm.; head black; thorax black, with the mesothorax green and the tubercles ferruginous; femora and the very robust hind tibiae black, ferruginous at apex; the other tibiae and the tarsi rather dark ferruginous, the middle tibiae suffusedly more or less infuscated; abdomen with the first two segments chestnut-red, the others very dark reddish, or the whole abdomen very dark, except the paler apex.

Mandibles yellowish in middle, red at apex; scape long and slender, ferruginous, the upper half fuscous above; flagellum dark, scarcely at all reddish beneath; mesothorax dullish, minutely granular; scutellum shining; area of metathorax large, minutely wrinkled; tegulae shining rufotestaceous; wings hyaline, rather yellowish, the large stigma dark sepia, nervures very dilute sepia; third t. c., etc., weakened; second s. m. much broader below than above, receiving first r. n. before its end; abdomen shining, with a microscopic transverse lineolation.

Runs in the table to 11, but differs in the coloration of the abdomen. It is nearest to *H. sphecodoides*, but the middle tibiae are red, and the abdomen is not black at base, though the first segment has a large black spot on each side near base (obscure in the darker variety). It may prove to be a local race of *sphecodoides*.

This and the last species belong to the subgenus *Chloralictus*.

Hab.—Mackay, Queensland, at flowers of *Eucalyptus*, March, 1900 (*Turner*). Variety with darker abdomen; Mackay, May, 1900 (*Turner* 7b).

***Halictus (Chloralictus) urbanus* Smith.**

A female in the Berlin Museum (17031) was collected in Australia by Schultz. This was no doubt M. Schultz of Port Darwin; cf. Proc. Australasian Assoc. Adv. Sci., xi, p. 199.

***Halictus (Chloralictus) humilis* Smith.**

Two females from Adelaide (*Schomburgk*) are in the Berlin Museum. In one, the legs are practically all black, with red knees; in the other the tibiæ and tarsi are ferruginous, and the middle and hind femora largely reddish. In the latter the stigma and nervures are pale ferruginous, in the former the stigma is darker, though not very dark. Both spurs of the hind tibiæ are alike, finely ciliate. The type locality of *humilis* was Champion Bay, which is certainly a long way from Adelaide; but so far as I can tell from Smith's description and my notes on his type, the present insect is true *humilis*. Richard Schomburgk lived at Adelaide; he forwarded to Europe plants collected by Schultz in Northern Australia, and very likely the Schultz bees may also have passed through his hands. There may be here a possible source of confusion in labels.

***Halictus (Chloralictus) dampieri* Ckll.**

This was described from the female. I have before me two males from Mackay, Queensland, Sept., 1891 (*Turner* 661). The male is a slender insect, with a long narrow dark green abdomen; antennæ black, the long flagellum strongly crenulated beneath; lower margin of clypeus broadly dull white; knees, and all the tibiæ and tarsi ferruginous. Details of sculpture, etc., as in the female.

Female *H. dampieri* was taken at Mackay, at flowers of *Xanthorrhoea*, April, 1899 (*Turner* 706). A blue-green variety is from Mackay, at flowers of *Eugenia*, Nov., 1899.

***Halictus flindersi* Ckll., var. a.**

Mackay, Queensland, March, 1892 and 1900 (*Turner* 440). This species is remarkable for having a very well formed ventral abdominal scopa of curled white hairs. In two of the specimens before me this scopa contains pollen. The "var. a," with green mesothorax and scutellum, seems to be the more normal form.

***Halictus behri* sp. nov.**

♀. Length fully $6\frac{1}{2}$ mm.; head bluish-green, clypeus a fine blue, mesothorax and scutellum shining, brilliant purple-blue; other parts of

thorax bluish-green inclining to steel-blue, not brilliant; tegulæ clear rufotestaceous; wings clear, nervures and stigma reddish-brown, outer nervures weakened as in *Chloralictus*; abdomen dark purplish, the apical segments greenish, hind margins of segments dark reddish-brown; a well formed ventral scopa of curled white hairs as in *H. flindersi*; coxæ, trochanters and femora dark, more or less metallic; knees, tibiæ and tarsi more or less ferruginous, but anterior tibia behind, middle and hind tibiæ and hind basitarsus mainly dark, though not metallic. Lower edge of clypeus fringed with yellowish hairs; mandibles ferruginous, except at base; scape long, basal half ferruginous; apical part of flagellum red beneath; area of metathorax with a very coarse reticulate sculpture; apical truncation sharply defined at sides; second s. m. rather large. Clypeus with distinct widely separated punctures; sides of front with a minute cancellate sculpture; mesothorax minutely roughened, with shallow punctures; hair of hind tibiæ and tarsi, and of abdominal scopa, very strongly plumose; hind spur peculiar, with two very large and thick obtuse teeth; abdomen with the usual fine transverse lineolation.

Close to *H. flindersi*, but differing in details of color and sculpture.

Hab.—Port Darwin, Australia, November, 1902 (*Turner*). British Museum.

***Halictus woodsi* sp. nov.**

♀. Length about $6\frac{1}{2}$ mm.; similar to *H. flindersi*, var. a, but differing thus: face narrower; upper half of clypeus brilliant green; area of metathorax longer, with more pronounced longitudinal ridges; abdomen greenish, the hind margins of the segments very narrowly but evidently red. The hind femora are distinctly twisted, and the ventral abdominal scopa is well developed. The flagellum is reddish at apex. Front transversely striate just below the ocelli, reticulate below that, but longitudinally striate on each side; mesothorax microscopically tessellate, with piliferous punctures, the anterior ones forming distinct lines, with little ridges; hind spur with large teeth.

♂. Length about 5 mm., rather slender, but looks like a female, the abdomen being short, and the flagellum comparatively short and thick, its length little over one mm.; clypeus shining, without any pale border; knees, tibiæ and tarsi ferruginous, the tibiæ more or less clouded with dusky.

Hab.—Cooktown, Australia (type locality), Oct., 1902, one female (*Turner*); Port Darwin, Dec., 1902, one male (*Turner*). British Museum.

The following table separates a number of Australian *Halictines* in which the mesothorax is not black.

- Mesothorax red or fulvous.....1.
 Mesothorax green or blue2.
 1. Abdomen black, slightly stained with red.
 Parasphecodes callomelittinus Ckll.
 Abdomen fulvous, slightly stained with blackish.
 Halictus rowlandi Ckll.
 2. Abdomen marked with yellow....**Nomioides perditellus** Ckll.
 Abdomen not marked with yellow.....3.
 3. Abdomen red or reddish, at least in part.....4.
 Abdomen black5.
 Abdomen green or blue or greenish or bluish6.
 4. Abdomen entirely bright red.....**Halictus eyrei** Ckll.
 Abdomen dark or dusky.....**H. tatei** Ckll.
 5. Metathorax green.....**H. urbanus** Sm.
 Metathorax black.....**H. humilis** Sm.
 6. Tibiæ red (males)7.
 Tibiæ dark, sometimes with some red8.
 7. Flagellum long; abdomen yellowish-green....**H. dampieri** Ckll.
 Flagellum short; abdomen bluish.....**H. woodsi** Ckll.
 8. Mesothorax brilliant blue.....**H. behri** Ckll.
 Mesothorax green.....9.
 9. Area of metathorax feebly sculptured.....**H. dampieri** Ckll. ♀.
 Area of metathorax strongly sculptured.....10.
 10. Head broader.....**H. flindersi** Ckll.
 Head narrower.**H. woodsi** Ckll. ♀.

Halictus ewarti sp. nov.

♀. Length nearly 7 mm.; head and thorax black, abdomen entirely bright chestnut-red; femora black, red at apex; tibiæ and tarsi entirely clear red, with yellowish hair; wings slightly dusky, stigma and nervures dilute sepia. Head about as broad as long; mandibles bidentate, ferruginous; clypeus and supraclypeal area very shiny, with scattered punctures; front and upper part of head generally with extremely dense large punctures; posterior orbital margins with a series of little ridges; scape long; flagellum thickened apically, ferruginous beneath, the last few joints also above; mesothorax very strongly and densely punctured, but in middle the punctures are separated sufficiently to show the shining surface; area of metathorax large, squarely cut off behind, shining, and with very strong, irregular, coarse ridges, like a *Sphæcodes*; tubercles densely covered with pale ochreous hair; pleura with exceedingly rough coarse sculpture; tegulæ shining rufopiceous; first r. n. joining second s. m. (which is not especially narrow) before the end; second t. c. on one side with the upper three-fourths wanting; hind spur microscopically serrate; abdomen smooth, almost wholly without punctures, but the third and following segments evidently hairy.

This is quite unique among the Australian species, having the appearance of a *Sphecodes*, but possessing the caudal rima, caudal floccus at base of hind legs, etc., of *Halictus*. The abdomen is very hairy beneath, but in the specimen before me, pollen has been collected mainly on the hind femora.

Hab.—Cairns, Queensland, "Kur., 1. 02" (*Turner*). British Museum.

***Halictus hedleyi* sp. nov.**

♂. Length about $5\frac{1}{2}$ mm.; head and thorax black, abdomen and legs mainly red; agrees with description of *Sphecodes tasmaniae*, except as follows: vertex with a very faint bluish tinge, and the mesothorax perhaps slightly blue-black, but so slightly that it is doubtful; facial quadrangle not broader than long, eyes strongly converging below; flagellum clear light ferruginous beneath; scape rather short; second and third antennal joints very short, about equal, fourth much longer; mesothorax, and especially scutellum, more hairy; thread-like longitudinal striæ occupying only about basal half of metathoracic enclosure, but these very distinct and regular; tegulae clear light reddish-testaceous; second s. m. receiving first r. n. much beyond middle; third s. m. not longer than second; hind tibiae and tarsi entirely clear red; second and third abdominal segments, and much of fourth, red, the hind margins broadly darkened; a small black spot at each extreme side of second and third; vertex clear red. The broad apical plate is just as in *Sphecodes* subg. *Proteraner*.

I think this is unquestionably congeneric with *S. tasmaniae*, but I now incline to consider both referable to a group distinct from typical *Halictus*, but not at present to be generically separated. The other species will, therefore, stand as *Halictus tasmaniae* (Ckll.). The discovery of the females is much to be desired.

Hab.—Port Philip, Australia (*Coulon*). Berlin Museum, 2248.

***Halictus bicingulatus* Sm., var. a.**

♀.—Rather less robust, area of metathorax smaller, hair on outer side of hind tibiae pale except at base.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 699). British Museum.

This has a patch of fulvous hair on postscutellum, but so has typical *bicingulatus*, contrary to the statement in my table.

The specimens without the patch were *rufipes* Sm. (*tertius* D. T.), but I think they are all varieties of a single species. I have a specimen of true *bicingulatus* from Smith's collection.

***Halictus forresti* Ckll.**

♂.—The flagellum varies to obscurely dull reddish beneath, and the mesothorax, especially posteriorly, may be quite shiny. Mr. Turner took it at Mackay, March, 1900. *H. sturti* Ckll. was also taken at Mackay in the same month.

***Halictus blackburni* sp. nov.**

♀. Length about 6 mm.; black, the head and thorax with rather scanty dull white hair; mesothorax dull, with a faint suggestion of greenish; abdomen shining, without hair-bands or patches, and the margins of the segments not at all pallid. Mandibles ferruginous subapically; tongue short dagger-shaped; face broad; flagellum obscurely brown beneath; area of metathorax with fine longitudinal rugæ, connected more or less by cross-lines, and not reaching the hind margins; tubercles densely covered with grayish-white hair, but not postscutellum; tegulæ dark reddish; wings hyaline, nervures and stigma dark rufo-fuscous, outer nervures of third s. m. and discoidal much weakened; second s. m. broad, little narrowed above; first r. n. meeting second t. c.; legs black, with white hair, more or less yellowish on inner side of tarsi; small joints of tarsi becoming ferruginous; fourth and following segments of abdomen with some long fuscous hair above; venter with curled white hair, forming a scopa. The following characters are microscopic: abdomen impunctate, microscopically transversely lineolate; mesothorax minutely tessellate, with scattered very shallow and inconspicuous hair-punctures (not visible with a lens); tegulæ lineolate; front sculptured like mesothorax, and not at all grooved; hind spur with four stout teeth, the last minute.

♂.—Much more slender; all the tarsi clear ferruginous, and a ferruginous spot at base and apex of tibiæ; second s. m. narrower; lower margin of clypeus rather broadly light yellow; antennæ only moderately long, dark.

Hab.—Mackay, Queensland; females (including type) at flowers of *Xanthorrhæa*, April and May, 1899, and at *Eucalyptus*, March, 1900 (*Turner* 915); males at *Xanthorrhæa*, Arpil, 1899 and 1900 (*Turner* 8a). Not closely related to any other species, but superficially like *H. sturti*.

***Halictus stirlingi* sp. nov.**

♀. Length about 6½ mm., very robust, rather suggesting a *Nomia*; black, the abdomen shining, hair of head and thorax pale ochreous, on

disc of mesothorax short and dark fuscous, dense and ochreous on upper border of prothorax and on tubercles, very dense and fulvous on postscutellum; head broad; mandibles dark, the extreme apex ferruginous; scape long, black; flagellum black at base, beyond with a dusty appearance, the apex red beneath; face and front malleate, with large dense shallow punctures, while on the mesothorax this is modified into a cancellate sculpture, the depressions separated by fine ridges, the general effect without high magnification being that of a very coarsely roughened dull surface; area of metathorax dullish, with a very coarse open network of raised lines, the longitudinal rugæ more numerous and prominent than the transverse ones; pleura rough; posterior face of metathorax finely grayish pruinose; tegulæ shining rufopiceous; wings slightly dusky, stigma and nervures reddish-sepia; second s. m. rather broad, but much smaller than third, receiving first r. n. well before the end; outer nervures scarcely weakened; legs black with yellowish hair, the tarsi more or less ferruginous; hind spur with a few very large teeth; abdomen with bands of dense fulvous tomentum at bases of second and third segments; first segment delicately punctured at sides, but scarcely at all in middle; second and third finely and closely punctured all over; caudal rima fulvous, with brown hair on each side; much orange pollen collected on hind femora and basal half of abdomen beneath.

Evidently related to the *H. bicingulatus* group, but easily known by the small size, dark legs, and peculiar sculpture of metathorax.

Hab.—Mackay, Queensland, April, 1900 (*Turner* 1081).

***Halictus maitlandi* sp. nov.**

♀. Length about 7 mm., robust, superficially similar to *H. stirlingi*, but structurally very different; black, head, thorax and abdomen dullish, with a sericeous lustre; hair of head and thorax pale, very scanty, except that the tubercles, adjacent lateral lobes of mesothorax, and the postscutellum, are very densely covered with fulvous hair; the sides and truncation of the metathorax also have much pale hair; head broad, the scanty hair of face yellowish; mandibles dark, a little reddish at base; scape red, black at apex, flagellum black; front with a microscopic tessellate sculpture running into fine lineoles, under a lens having a dullish submetallic sheen; mesothorax impunctate, under a high power of the microscope densely covered with minute file-like striæ; scutellum like front, and with a few minute punctures; area of metathorax large, dull and granular; tegulæ ferruginous, with some fulvous hair in front; wings rather dusky, the marginal cell and apical field beyond clouded with dark fuscous; stigma and nervures piceous; second s. m. larger than third (third remarkably short), first r. n. joining second t. c., b. n. less bent than usual; femora black,

tibiæ and tarsi rather dark chestnut-red, hind spur with four very stout blunt teeth, the last small; hind tibiæ and tarsi with much black hair; second and third abdominal segments each with a very even, clean-cut dense band of light fulvous hair; surface of abdomen microscopically transversely striatulate; fourth and fifth segments also with basal hair-bands, but these are almost wholly concealed by the segments before; hind margins of segments not at all pallid; caudal rima yellowish; sides of apical segment with long dark hairs; venter with a pale curled scopa.

A very curious species, combining the characters of the very dissimilar *H. stirlingi* and *H. blackburni*.

Hab.—Cairns, Queensland, "Kur., 3. 02" (*Turner*). British Museum.

***Halictus davidis* sp. nov.**

♀. Length about 10 mm.; rather robust, black, the abdomen shining coal-black without hair-bands or patches; resembles *H. carbonarius* Sm., but less strongly punctured. Mandibles black; clypeus shining, with sparse small punctures; scape black, flagellum faintly brownish beneath; front with scattered small punctures; ocelli amber-color, in a low triangle; vertex and sides of front with dark fuscous hair; mesothorax smooth, with a strong glaucous tint, and small scattered punctures, its anterior and lateral margins rather densely clothed with black hair; pleura strongly, mainly vertically, striate, with pale hair; upper margin of prothorax, and tubercles, especially the latter, densely fringed with white hair; area of metathorax ill-defined, except behind, where it is limited by a very sharp and prominent transverse rim; surface of area with a feeble rugose sculpture, the plicæ ill-defined and very weak; tegulæ piceous; wings strongly infuscated, brownish, nervures and stigma sepia; second s. m. rather large, receiving first r. n. at its apical corner; third s. m. much larger than second; legs black, the femora with white hair, tibiæ and tarsi with hair nearly all black; spurs ferruginous, hind spur with very fine teeth or spines, abdomen with very fine and minute punctures, the second and third segments also microscopically transversely lineolate; sides of abdomen, and apical half of venter, with black or dark fuscous hair; basal half of venter with white hair, more or less curled, forming a scopa.

♂. Length about $8\frac{1}{2}$ mm.; much more slender; greater part of clypeus light yellow, but the margin ferruginous; flagellum very long, strongly crenulate and dark coffee-brown beneath; area of metathorax larger and rather more strongly sculptured; first r. n. meeting second t. c.; anterior tibia red in front, tarsi becoming red at apex, tibiæ and tarsi with pale hair, a little dark on anterior and middle tibiæ. The striated pleura and glaucous mesothorax as in the female.

Hab.—Cairns, Queensland, "Kur., 4. 02" (Turner). British Museum.

The female is the type.

***Halictus papuarum* sp. nov.**

♀. Length about 5 mm.; black, face, front and mesothorax dull, the scutellum more shining; abdomen brownish, very dark, disc of first segment dark reddish, no hair-bands or patches, but apical segment with much yellowish hair; wings somewhat dusky, nervures and stigma piceous, third t. c. and second r. n. much weakened. Head broad; mandibles bright ferruginous; antennæ dark, scape reddish at extreme base, flagellum brownish beneath; clypeus, face and front without evident punctures, the front microscopically tessellate; mesothorax microscopically tessellate, with scattered extremely minute punctures; scutellum similar but smoother; area of metathorax having fine irregular anastomosing rugæ on its basal half, its apical rim distinct, shining; posterior truncation hairy; sides of metathorax with long hair; tegulæ light yellowish-testaceous; second s. m. very narrow, much higher than broad, receiving first r. n. very near its apex; third s. m. broad below, narrower above, the third t. c. with a single gentle curve; legs black, with pale yellowish hair, the knees more or less red; the tarsi ferruginous, the basitarsi more or less dusky; anterior basitarsus rather broad; hind spur with three very large blunt teeth, the other spur of hind tibia minute ciliate (denticulate); abdomen microscopally transversely lineolate, the hind margins very slightly rufescent; a copious ventral abdominal scopa.

Related to *H. latitarsis* Friese, but smaller, with red mandibles.

Hab.—New Guinea, "Kai Tubaut, '09" (Dr. Neuhauss). Berlin Museum.

A very commonplace little species, chiefly noticeable for its small size.

***Halictus lanarius* Smith.**

This was based on a female from Hunter River, New South Wales. Five females are in the Berlin Museum, four from Adelaide (*Schomburgk*), one from "New Holland" (*Shotzki*). The hind spur is peculiar, being apparently simple except for a very large broad truncate tooth near the base; with a high power of the microscope, the simple part is seen to be obscurely subdenticulate. I think *H. lanuginosus* Sm. is the male of this. Smith recognizes a female

lanuginosus, but says the clypeal margin is white; the antennæ of this species are short in the male, simulating a female, and readily accounting for the mistake. A male in the Berlin Museum is from Adelaide (*Behr*), and has been labelled by someone "*Halictus infimus* Er. ??." Erichson's species was described as an *Andrena* in 1841; it may belong to *Halictus*, but the description is insufficient for its identification. Another male, from Adelaide (*Schomburgk*), is rather less robust, and the second s. m. is very small and narrow. It is evidently an abnormal specimen. A female from Adelaide (*Schomburgk*) is smaller than usual (8 mm.), with the hind spur nodulose, and the tegulæ lighter. I was at first inclined to believe it distinct, but now conclude that it is only an individual aberration.

***Halictus cambagei* sp. nov.**

♂. Length about $5\frac{1}{2}$ mm.; black, with the abdomen and legs very dark brown, whole insect hoary with grayish-white pubescence. This is a male having relatively short antennæ, and a robust form, exactly simulating a female, and evidently to be associated with *H. lanarius*, from which it is easily known by its small size and shining mesothorax. Head broader than long; face broad, with much white hair; lower half of clypeus cream-colored, the edge very narrowly ferruginous; mandibles ferruginous except at base; scape rather short, shining black; flagellum obscurely brownish; face and clypeus shining, front dull; with a microscope the front is seen to be densely minutely punctured; mesothorax very shiny, with scattered evident punctures, the microscope showing a smooth surface, with occasional very minute punctures between the larger ones; scutellum brilliantly shining; area of metathorax with a very minute irregular reticulate sculpture, and a broad smooth shining rim; posterior truncation hardly defined; tegulæ shining rufous; wings hyaline, iridescent, nervures and stigma dull reddish-brown, not dark; second s. m. broad, receiving first r. n. very near end, third t. c. greatly bulging outwards; knees and tarsi rather obscure reddish; abdomen shining, thinly pilose, no hair-bands, nor any distinct patches, though the hair is a little more dense at sides of base of second and third segments, in some specimens forming obscure patches; second and third segments with very fine rather close hair-punctures. The second r. n. and third t. c. are very distinct, not very weak or almost obsolete as in *H. humei* and *H. globosus*.

Hab.—Adelaide, Australia (*Behr*). Berlin Museum; four males.

A small male *Halictus* from Adelaide (*Schomburgk*), about 6 mm. long, has the robust form of a female (even robust for a female!), and the clypeus all black; the flagellum is ferruginous beneath, strongly crenulate in profile, the middle joints about as broad as long. The specimen has been in some liquid, and is not in condition to be properly described. It is related to *H. oxleyi* Ckll., but differs at once by the shiny mesothorax, etc.

***Halictus leai* sp. nov.**

♀. Length nearly 9 mm.; black, the hind margins of the abdominal segments broadly ferruginous; pubescence in general scanty, pale yellowish, glittering white on cheeks beneath; femora rufous, ferruginous at end, tibiae and tarsi clear ferruginous, with pale yellowish hair; hind spur with a very large basal tooth, and beyond (apical of) it a large nodule. Head broad; mandibles red in middle; clypeus shining, with conspicuous punctures of different sizes; front dull, granular from excessively close minute punctures; flagellum obscure brownish beneath; sides of upper border of prothorax, margin of tubercles, and postscutellum densely clothed with light fulvous tomentum; mesothorax strongly and densely punctured, but shining between the punctures; punctures of scutellum much smaller than those of mesothorax; area of metathorax ill-defined, coarsely granular, microscopically reticulate; posterior truncation sharply defined, minutely hairy; tegulae shining rufofulvous; wings moderately dusky, nervures and stigma reddish-testaceous; second s. m. broad below, receiving first r. n. before its end; third s. m. large, outer nervures weakened; abdomen dullish, granular (minutely densely punctured), the apical margins of the segments broadly subhyaline ferruginous, and the extreme bases with entire bands of light fulvous tomentum; venter with much pale hair, which is used to gather pollen, though not nearly so much as the scopa of hind legs.

Related to *H. bicingulatus*, which it superficially resembles, but abdomen very much broader at base, scape black, etc.

Hab.—Victoria (*C. F.*; Turner collection). British Museum.

***Parasphecodes callomelittinus* sp. nov.**

♀. Length about $8\frac{1}{2}$ mm., wings very long and ample; head black, the front dull and granular, the face more shining; ocelli small; mandibles bidentate; clypeus very small; supraclypeal area large, convex; scape long; flagellum short, obscure reddish beneath; hair of

head and thorax very scanty, white below, mostly fuscous above; mesothorax, scutellum, postscutellum (except at sides) and pleura dull ferruginous, the color exactly as in *Callomelitta*; prothorax black, with the anterior border, next to occiput, red; metathorax black, shining, the area dull, not clearly defined; mesothorax shining, with minute scattered punctures; tegulæ shining dark reddish; wings dusky, but considerably paler than in *Callomelitta*; stigma and nervures very dark brown; lower section of b. n. strongly bent, falling short of t. m.; first r. n. joining second t. c.; third s. m. subquadrate, the second and third together not quite so long as first; legs very dark brown, the anterior and middle femora black, with red knees; hind femora with a white, curled, polleniferous scopa; hind spur simple; abdomen shining black, the first two segments, and the hind margins of the others, very obscurely reddish; no hair-bands; apex with dark fuscous hair; venter with glittering white hair.

A very singular species, almost perfectly imitating *Callomelitta*, and also looking not unlike an ant. I place it in *Parasphecodes* rather than *Halictus*, as it has the general build and simple hind spur of that genus. It will be easily known by the *Callomelitta*-like coloration.

Hab.—Melbourne, Victoria, Aug., 1900 (C. F.; Turner collection). British Museum.

***Parasphecodes contaminatus* sp. nov.**

♂. Length about 8 mm.; slender, light rufofulvous (approaching orange), with the head blackish, but the clypeus pale yellowish (strongly contrasting with the dark supraclypeal area); the mesothorax (except at sides) and a large patch on mesopleura dark brown (probably black in some; the specimen seems slightly immature); fourth abdominal segment with the apical margin broadly brownish, fifth and sixth with the apical half shining very dark brown; legs wholly without dark color. Hair of head and thorax very short moss-like, light ochreous; eyes large, converging below; face narrow; antennæ light fulvous, the flagellum dusky above except at base; mesothorax shining, bare except around margins; area of metathorax large, without evident sculpture except oblique striæ at sides; tegulæ pale testaceous; wings ample, with a large dark cloud occupying the marginal cell, below and beyond, but not the apex of the wing, though that is darker than the part before the cloud; nervures and the large stigma dark fuscous; first r. n. joining second t. c.; abdomen parallel-sided, apex rounded. Third joint of maxillary palpus with the apical two-thirds very dark; scape very short; mesothorax with very fine punctures; abdomen very minutely roughened.

Known from all other species by the entirely red metathorax and clouded wings.

Hab.—Cairns, Queensland, "Kur., 1. 02" (*Turner*). British Museum.

***Parasphecodes schomburgki* sp. nov.**

♀. Length about $8\frac{1}{2}$ mm., robust; head and thorax black, with grayish white hair (no black); abdomen rich chestnut-red, the fourth segment except base and the apex, dark but not black; first two segments finely punctured; wings hyaline, slightly reddish, stigma and nervures light ferruginous, first r. n. entering second s. m. a short distance before end, second s. m. about as broad as high; second r. n. and third t. c. weakened. Tongue short, pointed, apparently broader than long; joints 3 to 5 of maxillary palpi broad and oblique at apex, with the apical corner somewhat produced; mandibles dark reddish except at base; face broad; clypeus and supraclypeal area microscopically sculptured, and with large well separated punctures; sides of face minutely wrinkled and very densely punctured; front extremely densely punctured; extreme base of scape minutely closely punctured, but the shaft microscopically lineolate; antennæ entirely ferruginous, the scape dusky, the flagellar sutures dusky above; mesothorax dull, minutely granular-punctate; area of metathorax rather coarsely longitudinally wrinkled, nearly its apical third smooth; apical truncation of metathorax heart-shaped, well-defined, smooth and shining, with a deep median sulcus; pleura rough; tegulæ shining chestnut-red; legs dark ferruginous, with pale yellowish hair; hind spur simple; abdomen moderately hairy.

In my table of *Parasphecodes* (*Ann. Mag. Nat. Hist.*, Sept., 1904) this runs nearest to *P. lithusca*, but is separated by the character of the metathorax.

Hab.—Adelaide, Australia (*Schomburgk*). Berlin Museum, 22122. This locality seems to be rich in *Parasphecodes*, having already furnished *P. hilactus* Sm., *P. adalaidæ* Ckll., *P. loweri* Ckll. and *P. tepperi* Ckll.

***Parasphecodes sextus* sp. nov.**

♂. Length about 9 mm.; head and thorax black, with pale hair, faintly tinged with ochreous above; abdomen rather robust, the first three segments a very fine chestnut-red, without dark markings, the fourth and following ones black; fourth ventral with a large red mark; femora reddish-black, the knees ferruginous; anterior and middle tibiæ and tarsi clear red, with pale golden hair; hind tibiæ and tarsi red, but much darker; wings ample, hyaline, a little dusky in apical

field, but nowhere dark; stigma and nervures amber-color, first r. n. meeting second t. c.; second s. m. broad, but third much larger. Face covered with dull pale ochreous hair; eyes strongly converging below, inner orbits with a double curve; tongue and maxillary palpi as in *P. schomburgki*; clypeus with the lower half light yellow, sending a median projection upwards; scape dark, extremely short; flagellum very long, at least $5\frac{1}{2}$ m.m., strongly crenulate beneath, its lower side entirely red except the very short first joint, the slightly longer second joint clear red, contrasting; front, vertex, mesothorax and scutellum dull, densely granular-punctate; area of metathorax entirely covered with coarse rugæ; apical truncation rather small, hairy, ill-defined; tegulæ rather large, apricot-color; first two abdominal segments finely punctured, as in *P. schomburgki*.

The difference in venation, and the marked difference in the structure of the metathorax seem to indicate that this cannot be the male of *schomburgki*. It seems nearest to the Tasmanian *P. altichus* Sm., but differs by the excessively fine dense punctuation of the mesothorax, the poorly defined metathoracic truncation, the red tibiæ, etc..

Hab.—Adelaide (*Schomburgk*). Berlin Museum, 22114.

Parasphecodes froggatti Ckll.

Victoria (*C. F.*; Turner collection). British Museum.

Parasphecodes vulneratus sp. nov.

♂. Length hardly 9 mm.; abdomen much smaller and less robust than in *P. froggatti*; head and thorax black, with grayish-white hair, pale fuscous on vertex, scutellum, and slightly on hind part of mesothorax; dense hair of face grayish-white; clypeus produced, its lower half pale yellow, with the usual upward projection; antennæ appearing entirely black (flagellum broken in middle), but close inspection shows a small red spot on third joint, and a reddish suffusion on under side of flagellum beyond; ocelli in more of a triangle than in *P. sextus*; front vertex, mesothorax and scutellum uniformly exceedingly minutely granular punctate; area of metathorax semi-lunar, with longitudinal wrinkled rugæ extending to posterior margin; posterior truncation as in *P. sextus*; tegulæ piceous with the outer part broadly pale ferruginous; wings moderately dusky, the apex a little darker, stigma and nervures very dark reddish-brown; outer nervures strong; first r. n. meeting second t. c.; second s. m. higher than broad; legs slender, moderately hairy, shining black, the knees, anterior tibia in front and middle tibia at apex, red; abdomen with the basal part finely punctured; first three segments bright chestnut-red, the others black, except a red spot on middle of fourth.

This may be the male of some described female, but if so, I cannot guess which. It seems nearest to *P. hilactus* Sm., but differs conspicuously in the color of the legs.

Hab.—Victoria (C. F.; Turner collection). British Museum).

***Parasphcodes cirriferus* sp. nov.**

♀. Length about $12\frac{1}{2}$ mm., anterior wing 8; head and thorax black, with pale hair, which is strongly ochreous-tinted on head and thorax above, the dense fringe of the tubercles is also ochreous; head broad; clypeus broad, little produced, shining, with a median groove, and sparse very strong punctures, it is also wholly black; from beneath margin of clypeus projects a long fringe of golden hairs; mandibles bidentate, with a dark red band; front densely granular-punctate; ocelli forming a curved line rather than a triangle; scape long; flagellum, except at base, very obscurely reddish beneath; mesothorax with the median and parapsidal grooves distinct, everywhere very densely rugosopunctate except the disc beyond the middle, where the punctures are larger and evidently separated, showing the shining surface between (this peculiarity is very distinctive of the species); pleura transversely, more or less obliquely, striate, the striæ on the posterior part coarser and stronger; area of mesothorax coarsely, very irregularly wrinkled, with a strong posterior margin; posterior truncation heart-shaped, well-defined, smooth and brilliantly shining, with a strong median sulcus, which is beset with reddish hairs, increasing to form a conspicuous tuft, extending on either side, at its upper end; tegulæ shining rufous, dark basally; wings strongly reddish-dusky, the nervures fuscous, the large stigma redder; second s. m. broad, first r. n. joining second t. c.; b. n. falling very little short of t. m.; legs with pale hair, ferruginous on inner side of tarsi; hind trochanter and femora with a large plumose scopa; hind tibiæ very hairy; hind spur ciliate; abdomen dark chestnut-red, the fourth and following segments black, and from the third on with much coarse black hair; basal part punctured much as usual, but not uniformly.

Known by its large size, dusky wings, tufted truncation of metathorax, etc. It seems nearest to *P. tilachus* Sm., but that is smaller, with the clypeus produced. In *P. tilachus* the second r. n. and third t. c. are much weakened, in *cirriferus* they are slender, but still dark and conspicuous.

Hab.—Victoria, Australia (C. F.; February, 1901; Turner collection). British Museum.

Two large rufofulvous mites are attached to the metathorax.

Parasphecodes vau sp. nov.

♀. Length about 8 mm.; head and thorax black, the clypeus marked with obscure red in the same manner as it is marked with yellow in the males; abdomen robust, with the usual fine punctures, dark red, including the fourth segment, first segment with a large thick inverted V in black, no patches of hair, but apical half of abdomen thinly hoary, third and fourth segments with scattered black bristles, apex with black hair; femora black, red at apex, tibiae and tarsi red; middle tibiae with fuscous hair on outer side; hind spur minutely denticulate; tegulae clear red; wings very dusky, the apex not noticeably darker than the rest; stigma and nervures rufotestaceous, second s. m. about square, first r. n. joining second t. c.; scutellum and postscutellum covered with dense moss-like ochreous tomentum, the short hair of head and thorax above generally, and the dense fringe around tubercles, ochreous, but on the ventral surface of thorax and abdomen it is white. Head broad; apical half of mandibles dark red; flagellum dull ferruginous beneath; hair of face ochreous; front dull, densely rugosopunctate; mesothorax rather shining, with small and close but distinct punctures; area of metathorax shining, its basal half with very fine striae; posterior truncation smooth, without any tuft at top; pleura granular, posteriorly striated.

Nearest, I think, to *P. lacthius* Sm., but distinguished by the color of the clypeus, the sculpture of the metathorax, etc. By the dark wings it recalls the much larger *P. cirriferus*.

Hab.—N. W. Australia (*C. F.*; Turner collection). British Museum.

Parasphecodes basilautus sp. nov.

♀. Length about 8 mm.; very close to *P. vau*, with the same general form and colors, red area on clypeus (but more extended, leaving only a couple of semi-circular black areas), sculpture of front, mesothorax and metathorax (but striae of last rather finer and more regular), ochreous hair-patch covering scutellum and postscutellum, etc. The differences are as follows: red area of clypeus dull, impunctate (in *vau* shining, with a few large punctures); head smaller; when metathorax is seen from above, the corners bounding truncation are much less angular; wings hyaline orange-tinted, the apex faintly dusky; femora red, a little blackened at base; hair on outer side of middle tibiae entirely pale golden, as is all the hair on tibiae and tarsi; first two abdominal segments entirely red, third red with a median black suffusion on basal half, fourth and following black, with coarse black hair.

♂. Similar but not so robust; wings rather more dusky, and hardly yellowish; fourth abdominal segment black with the apical margin broadly yellowish subhyaline, but fifth and sixth black to margin;

face, except clypeus, with dense ochreous hair; clypeus with the lower half and a conical projection upwards light yellow; scape short and black; flagellum long, clear ferruginous beneath; fine striæ on area of metathorax covering about two-thirds of surface.

Among Smith's males this may be compared with *P. altichus*, but differs at once in the color of the legs, the tibiæ and tarsi being entirely red, the femora red in front, but with the basal three-fourths black behind.

Hab.—Cairns, Queensland, "Kur., 4. 02" (*Turner*). British Museum. The female is the type.

The following table separates a series of Australian Halictiform bees in which the mesothorax is black (in *P. contaminatus* dark brown), and the abdomen is at least mainly red or rufofulvous.

Metathorax and abdomen rufofulvous.

***Parasphecodes contaminatus* Ckll.**

- | | |
|--|--|
| Metathorax black | 1. |
| 1. Metathorax with very strong rugæ, and mesothorax very coarsely punctured; <i>Sphecodes</i> -like species..... | 2. |
| Metathorax without such strong rugæ, and mesothorax finely punctured..... | 3. |
| 2. Tibiæ clear red..... | <i>Halictus ewarti</i> Ckll. |
| Tibiæ dark | <i>Sphecodes profugus</i> Ckll. |
| 3. First r. n. entering second s. m..... | 4. |
| First r. n. joining second t. c.; none of the species small..... | 5. |
| 4. Small, length a little over 5 mm.; apex of male abdomen as in <i>Proteraner</i> | <i>Halictus hedleyi</i> Ckll. |
| Much larger; flagellum red above and beneath. | |

***Parasphecodes schomburgki* Ckll. ♀.**

- | | |
|--|-----------------------------------|
| 5. Tibiæ and tarsi red; clypeus partly red (♀) or yellow (♂)..... | 6. |
| Tibiæ and tarsi mainly dark..... | 8. |
| 6. Scutellum and postscutellum densely covered with ochreous moss-like hair..... | 7. |
| Scutellum and postscutellum without such hair..... | <i>P. sextus</i> Ckll. |
| 7. Abdomen dark reddish, segments 3 and 4 about same color; first segment with a reversed black V..... | <i>P. vau</i> Ckll. |
| Abdomen bright chestnut-red, in female wholly black beyond third segment; no V on first segment..... | <i>P. basilaetus</i> Ckll. |
| 8. Larger, general color of thoracic hair ochreous or fulvous. | |
| | <i>P. cirriferus</i> Ckll. |
| Smaller, general color of thoracic hair white..... | 9. |
| 9. Larger, hind legs more hairy..... | <i>P. froggatti</i> Ckll. |
| Smaller, hind legs less hairy..... | <i>P. vulneratus</i> Ckll. |

Sphecodes profugus sp. nov.

♀. Length about 9 mm.; head and thorax black, abdomen dark castaneous, black at apex; hair of head and thorax scanty and white, more abundant on sides of thorax and on face; head large, broader than long (breadth about 3 mm.), but not nearly twice as broad as long; mandibles black, faintly reddish in middle, with a well developed inner tooth; process of labrum deeply emarginate; antennæ entirely black, third joint bulging beneath, flagellum short; front minutely rugose; mesothorax and scutellum shining, with large punctures, well-separated except at sides; base of metathorax shining, divided by strong ridges into a number of irregular polygonal spaces; tegulæ shining piceous; wings moderately dusky, stigma and nervures very dark brown; second s. m. very narrow, receiving first r. n. some distance before its end; third s. m. large; legs black with light hair, small joints of tarsi ferruginous; hind spur simple; no evident scopa, abdomen shining, first segment with very minute widely scattered punctures; a slight depression at base of second segment (visible in lateral profile); apex hairy.

♂. Length about 7 mm., much less bulky; abdomen lighter red, distinctly punctured, the first segment much more distinctly and closely than in the female; legs brownish; scape very short; flagellum robust and long, very strongly crenulated, the joints nodose beneath.

The tongue in this species is extremely short, forming nearly an equilateral triangle. The sexes were associated by the collector, and no doubt belong together, in spite of the difference in abdominal punctuation. The insect is allied to *S. biroi* Friese, from New Guinea, but much larger.

Hab.—Mackay, Queensland, May, 1900 (*Turner*, 94). British Museum. The female is the type.

Apis mellifera ligustica Spinola.

Boulder, Colorado, freely visiting *Tragopogon porrifolius* L., sucking. Knuth cites no visitors of this plant.

Gastropsis pubescens (Smith).

Victoria, Australia (*C. F.*; *Turner* collection). British Museum.

Emphor bombiformis (Cresson).

Fedor, Texas, July, 1909, at flowers of a Malvaceous plant, thought to be *Fugosia* (*Birkmann*). Mr. Birkmann writes that he has been collecting bees in this vicinity for twenty-five years, and never saw *Emphor* until 1909.

Greeleyella polytricha (Ckll.).

Mr. Birkmann sends me numerous specimens of both sexes, which he has taken mated. The female is *Greeleyella resinata* Ckll., 1910, and the male *Panurginus polytrichus* Ckll., 1909. From the description I thought it possible that Viereck's *Birkmania andrenoides* (published about twenty-five days later than *P. polytrichus*) might be the same insect, but Mr. S. A. Rohwer, after comparing my description of *G. resinata* with Viereck's type, concludes that they are not identical. They are, however, certainly congeneric.

A male and female *G. polytricha* are marked as from flowers of *Allium*.

Nomioides perditellus Ckll.

Described from the female. The male is more slender, head greenish-blue, thorax shining blue; eyes strongly converging below; clypeus, labrum and mandibles (except rufous tips) yellow; scape extremely short, yellow in front; flagellum long, brown above, pale yellowish beneath; abdomen dark brown, with only one yellow band, on basal part of third segment, this narrowly interrupted in the middle, and squarely cut off some distance from lateral margins; apical plate broadly truncate, the truncation slightly emarginate. Female; var. a. Head and thorax yellowish-green; a short transverse yellow band on hind border of mesothorax, and a similar one on postscutellum.

Hab.—Mackay, Queensland, March, 1900 (*Turner* 438). The sexes were associated by the collector. This is the only Australian *Nomioides*.

Trigona tescorum sp. nov.

Worker. Length about $5\frac{1}{2}$ mm., short and broad, black, head and thorax dull, metathorax and abdomen shining; wings strongly suffused with reddish-brown; face broad, with a fine white pruinosity.

In Friese's table (*Die Bienen Afrikas*) this runs nearest to *T. clypeata*, from which it is easily known by its larger size, less shining face, clypeus not pale margined, and dark wings. In *T. clypeata* the b. n. meets the t. m., in *T. tescorum* it falls short of it. In *clypeata* the abdominal segments are

entirely shiny, in *tescorum* the hind margins of the segments are dull and granular, and the apical ones being retracted, the whole apical end of the abdomen appears dull. The hair on inner surface of hind basitarsus is dark, whereas in *clypeata* it is clear ferruginous. The flagellum is reddish beneath toward the apex, and the tegulæ are piceous. Under the microscope the mesothorax in both species shows a fine densely malleate sculpture, but although *tescorum* is the larger, the sculpture is very much finer than in *clypeata*.

Hab.—Benguella, Africa (*Wellman*, 1471). *Wellman's* 1243, from the same locality, is *T. gribodoi* Magr.

***Trigona topiorum* sp. nov.**

Worker. Length about 6 mm., short and broad, black, marked with lemon-yellow; face very broad, front dull and minutely granular, supraclypeal area and lower parts of face shining; front, vertex, labrum and base of mandibles with dark reddish hair; mandibles ferruginous, yellow at base, with a long straight cutting edge, and two little long-triangular teeth at the inner apical corner; yellow markings of head consisting of a spot behind base of mandibles, a narrow stripe along anterior orbits, failing above, and a suffused mark on each side of clypeus below; scape with a red stripe, including most of base, and narrowing apically; flagellum obscurely reddish beneath; hair of thorax ferruginous, rather abundant; mesothorax and scutellum dull and granular; a yellow stripe runs along each side of mesothorax, includes axillæ, and becoming about twice as broad, margins scutellum, leaving the latter with a black semi-circular area; prothorax above (interrupted in middle) and tubercles yellow; tegulæ clear rufotestaceous; wings yellowish, dusky hyaline, stigma and nervues ferruginous; b. n. meeting t. m.; two well defined submarginal cells; legs black, small joints of tarsi ferruginous, a dull yellow mark at base of anterior femora, and a spot at base of middle ones; hair on inner side of hind basitarsus fox-red; abdomen short and broad, piceous, not hairy, with variable light yellow lateral spots, that on second segment large and subquadrate; no bands.

Runs in Friese's table to 13, and runs out because the mesonotum is yellow margined and the abdomen is not red. Nearest, I think, to *T. conradti* Friese, but differing in many details. (I have compared an authentic *conradti*, collected by Conradt.)

Hab.—Benguella (*Wellman* H 92). Two specimens.

Trigona cincta Mocsary.

This species was described from New Guinea. In the Berlin Museum are four specimens from Australia (Hermannsburg, Finke River, *V. Leonhardi*). One of these has been labelled "*cincta?*" by Friese, and they seem to agree well with Mocsary's description, except that they are distinctly larger, up to 5 mm. long. They are allied to *T. essingtoni* Ckll., but easily separated by the coloration of the clypeus.

Trigona cassiæ sp. nov.

Very like *T. carbonaria* Sm., and is, perhaps, the species recorded from Mackay by Friese as *carbonaria*. In the worker the mesothorax is very smooth and shining; axillæ black; the prominent scutellum with a broad transverse dusky yellowish band, and all its hair dark fuscous; tubercles light-spotted; upper border of prothorax not hairy; nervures and stigma reddish fuscous, not very dark. In the male the flagellum is entirely pale fulvous beneath (obscurely reddish in *carbonaria*); the last joint is less flattened, while in *carbonaria* it is so flat at end as to appear very acutely pointed in lateral view; face narrower below than in *carbonaria*, scutellum not pale-banded. Smith does not describe the male of *carbonaria*, but I have specimens from Sydney, N. S. W.

Hab.—Mackay, Queensland, worker at flowers of *Cassia*, Dec., 1899 (*Turner*, 900); male, Nov., 1891 (*Turner*, 318). The worker is the type.

Andrena cyprica sp. nov.

♂. Length about $13\frac{1}{2}$ mm., expanse nearly 24; entirely black, the head and thorax rough, the abdomen shining, nude, without bands; hair entirely black or brown-black (more evidently nigrofuscous on head and thorax above), except on inner side of tarsi, where it is ferruginous; the basitarsi at apex, and all the small joints, are ferruginous; head broad, facial quadrangle much broader than long; the abundant black hair of face erect; clypeus densely punctured, but shining between the punctures; process of labrum sharply bidentate; mandibles long, falciform, not toothed at base; cheeks extremely broad, but the posterior angle rounded; antennæ entirely dark, the flagellum thick; third antennal joint much longer than fourth or fifth, fourth a little shorter than fifth; mesothorax well punctured, but the

dull surface visible between; metathorax rounded, very rough, the area small, triangular, inconspicuous, bounded by a line; wings yellowish-hyaline, with a dark red-brown cloud occupying apex, and a cloud across second submarginal cell and into third; second s. m. very broad, receiving first r. n. before middle; abdomen fusiform, very finely punctured, second segment depressed about a third.

Near to *A. carbonaria* L. (*pilipes* Rossi), but the wings are paler basally, the abdomen is more finely punctured, and the legs are not entirely black-haired. The apical ventral segment, as in *carbonaria*, is emarginate. The *A. carbonaria* before me is from Sicily, and has the second submarginal cell narrower and more oblique than in *cyprica*. There is also a strong resemblance to *A. morio* Brullé, but that has the third antennal joint shorter, the cheeks less developed, the wings much darker, etc.

Hab.—Cyprus, March 17 (*C. Glaszner*). British Museum.

***Andrena batesiae* sp. nov.**

♀. Length about 14 mm., expanse 26; hair of thorax above, including tubercles, upper part of pleura and sides of metathorax, deep fox-red, as in *A. nitida*; face with rather dull fulvous hair, forming a conspicuous tuft on each side, but supraclypeal area and scape with black hair; clypeus very densely punctured, with no smooth line; process of labrum emarginate; facial foveæ dark coffee-brown, very broad, going below antennæ, separated from eye by a practically uniform narrow band; antennæ black, third joint longer than 4 + 5, but not so long as 4 + 5 + 6; lower part of pleura with the hair dusky yellowish, but middle and hind coxæ with it black; mesothorax densely punctured; metathorax very coarsely granular, the area long and very narrow, poorly defined, the sculpture hardly differentiated; hair of anterior femora beneath like that on lower part of pleura, that on inner side of anterior tarsi dull red, otherwise the hair of legs generally is black; hind spurs uniform ferruginous; abdomen broad, finely punctured, a little dull pale hair on first segment and at sides of base of second, but no evident bands of any sort; apical fimbria black; ventral segments very dark, faintly reddish; wings reddish-fuliginous, not so dark as in *A. morio*, second s. m. broad, receiving first r. n. beyond middle.

Compared with *A. nitida* (Dover, England) this is practically identical in all details of structure, and is manifestly very closely allied. It differs, however, by its much darker wings, absence of conspicuous light hair on abdomen, and color of hair of face. It is, no doubt, an insular representa-

tive of *nitida*. Compared with *A. thoracica*, var. *assimilis* Rad., it differs by the color of the spurs and some other details; I have not seen *assimilis*, but *batesiæ* is certainly not a variety of *thoracica*. It also resembles *A. pectoralis* Perez, but differs in a number of details.

Hab.—Cyprus (*Miss Bates*). British Museum.

***Andrena cameroni* n. n.**

Andrena caroli Cameron (not of Perez, 1895). Simla. Allied to *A. mephistophelica* Cam.

***Andrena sinensis* sp. nov.**

♀. Length about 14 mm.; thorax densely covered with bright fox-red hair; abdomen black, shining, not banded or covered with hair, the apical fimbria black; wings very dark, with a violaceous tint; pleura (except uppermost part) and pectus with black or sooty hair; hair of head black except on occiput, where it is fulvous; hair of legs black; process of labrum broad, shallowly emarginate; clypeus densely punctured but shining, without a smooth line; facial foveæ broad, very dark purplish-brown; third antennal joint longer than 4 + 5, but not so long as 4 + 5 + 6; metathorax very coarsely granular, the area scarcely distinguishable; second abdominal segment depressed fully two-fifths.

In Schmiedeknecht's table (*Apidæ Europææ*) this runs to *A. thoracica* var. *assimilis* Rad., except that the hind spurs are uniform rich dark ferruginous. In size and superficial appearance it is exactly like *A. batesiæ*, except for the fact that the wings are dark right to the base, while in *batesiæ* they are pallid basally. Upon close comparison the following differences from *batesiæ* are apparent: hair of face all black or sooty; abdomen without pale hair near base, and considerably less punctured. On the first segment and basal half of second the punctures are small and scattered, while on apical half of second they are still fewer and extremely minute. In *batesiæ* they are much more dense, and are so all over second segment.

Hab.—Tientsin, China, June 15, 1906 (*F. M. Thomson*). British Museum.

China must be rich in *Andrena*, but only two (*vitiosa* Sm. and *anthracina* Mor.) seem to have been described. Four others have been described by Morawitz from Mongolia.